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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Fuel Research Board's Report

IF only for the fact that for its supply of fuel oils of all kinds this country has to depend upon overseas sources, the problem of the low temperature carbonisation of coal must always be one of national importance. Within the past few years a considerable amount of attention has been given to the problem by a number of individual workers; but whereas great progress has been made from the technical standpoint one is always face to face with the uncertain economic elements. There can be no question that from the commercial point of view the production of smokeless fuel has not as yet proved itself attractive, and it may take some time to live down this feeling of uncertainty. However, the question is now being attacked on the right lines, and one cannot fail to be struck with the dispassionate manner in which both successes and failures have been recorded in the Reports which have been prepared by the Fuel Research Board. Sir George Beilby's latest and most valuable contribution to the literature of the subject has just been issued; and, while a record is given of the more recent technical progress which has been made at the Greenwich experimental station, it is the thoughtful suggestions for effecting co-operation between the low temperature process and certain other well-established industries that will mainly attract attention.

The principal three products upon which the low temperature carbonisation industry must be based are coke, oils, and gas. For the oil-products there is practically an unlimited outlet, but the prices at which they must be sold (fuel oil now ranges from £3 to £4 per ton) will for many years to come be entirely controlled by the inevitable fluctuations in the world's output of petroleum. So far as the rich gas produced is concerned, it is suggested that the widest and most natural outlet would be as an enriching agent for raising low-grade gas to a higher standard of calorific value. In this direction, of course, the unusual conservatism of the towns gas industry will have to be broken through, and the gas engineer will have to be persuaded that low temperature coal gas, owing to its high concentration and constancy of disposition, lends itself admirably for admixture as required with the leaner high temperature gas. In still further support of this argument, mention might have been made of the recent notifications given by some of the larger gas undertakings in connection with their "declared" calorific power. From these notifications it would appear that the gas undertakings are breaking away from the principle of comparatively low-grade gas supply, and that from the commercial and manufacturing standpoints a higher quality gas seems to carry advantages. Accordingly, if higher standards are to rule, there will be all the more opportunity for employing the residual gas from low temperature plants. It might be gathered from Sir George Beilby's report, however, that the process will not economically be operating under the best of conditions unless it is allied with and under the care of existing works in which the products could be employed.

On Monday evening Sir George Beilby dealt with the subject of "The Structure of Coke" in a lecture before the London Section of the Society of Chemical Industry. His contribution was described by Dr. Lessing as of "fundamental" importance, and as the chairman (Mr. E. V. Evans) confessed himself "overwhelmed" by the results, and Mr. E. C. Evans, another expert on the subject, added his tribute to the "brilliant" character of the paper, one may assume that Dr. Lessing's estimate of its value was justified. In the circumstances we are sorry to be unable to publish a fuller notice of the lecture than the rather meagre report of a few lines officially released for publication.

The Work of the Federal Council

AN account of the general work and aims of the Federal Council of Pure and Applied Chemistry, which Dr. Stephen Miall recently contributed to an American journal, appears to be attracting considerable interest over there, and a note on it may not be inappropriate here. Dr. Miall admits that the Federal Council is too recent a creation to make its influence felt in Government circles; otherwise some recent Acts, so far as chemicals are concerned, might have been of a very different character. In Parliament, he says, the men who understand chemistry and its needs could be numbered on one's fingers, and most of them are put in positions where their knowledge will not be liable to bias their views. The average politician, we are told, seems to regard the chemist as "something between an alchemist and a druggist—a clever crank, to be listened to with the courtesy the Government official is accumstomed to display, but who may be forgotten as soon as his back is turned." Finally, Dr. Miall states, the Federal Council hopes in time to be able to keep the country on the right track in matters pertaining to chemistry.

All this points to a weakness, to which we have more than once drawn attention, in the relation between chemical interests and national interests. There are some branches of science—astronomy may serve as an illustration—which have no immediate bearing on national industry or politics. Minute changes in the arrangements of the Solar system may be of absorbing interest to the pure scientist, but they are not likely appreciably to agitate the exporter of soaps or the importer of santonine. With chemistry it is different. It is interwoven with nearly every national industry; it is at times of vital importance to the nation, and rarely a week passes without some reference to it being made in Parliament. In these circumstances both the nation and chemistry suffer from the lack of mutual knowledge and understanding. The fault, we think, lies more with chemical methods and organisation than with Parliament or the public. If chemistry is to exercise its proper influence in the nation, it must take the necessary steps to inform the nation of its work and its views. This can be done in two ways—the one direct, the other indirect.

The direct way is through such central bodies as the Federal Council, representing the principal chemical and allied organisations. The Council derives its authority from the weight and number of its constituent associations, and has thus a great advantage to start with. Its representative composition, however, may sometimes be a drawback in the sense that a group of very different societies have to be kept in step, and the pace has generally to be accommodated to the slowest. Where, in addition, any element of internal jealousy is developed, the association together of many bodies may result in a neutralisation of their activities. The Federal Council has therefore to move diplomatically to carry all its forces along with it, but it is composed of extremely able men and presently it may become a real power. From what we know of the Council, it would not be difficult to select, say, half a dozen of its members, so competently informed in the science, technology, and industry of chemistry on the one side, and so closely in touch with public life on the other, as to make an almost ideal body for liaison purposes.

The other method is the indirect one of informing the public generally of what chemistry is doing or of allowing the public to inform itself through the recognised channels. Members of Parliament and other classes of public men depend largely for their knowledge of such matters on press information, and if the deliberate policy of official bodies is to prevent the publication of such information, the responsibility for the public ignorance on chemical matters must rest with themselves. One cannot, to put it shortly, keep the doors locked and the shutters up, and then wonder why outsiders are uninformed of what is going on inside. This policy would make an extremely interesting topic for open discussion some day.

Economy in Fuel Utilisation

THE fact that our occasional allusions in these columns to the problems connected with the efficient operation of steam-raising plant are usually followed by enquiries for further information would seem to indicate that chemical works engineers certainly have some appreciation of the monetary loss which attends indifferent steam-raising. At the present time it is more important than ever to keep on reminding works managers of their delinquencies so far as fuel consumption is concerned, for there has been a remarkable drop in the price of all forms of fuel, and it was cheapness which was mainly responsible for the apathetic manner in which fuel extravagance was regarded in the past. Apart from the question of fuel conservation being one of national interest, it must be borne in mind that cheap fuel is reflected in the price of most commodities and products, and if economic utilisation effects only a saving of a few pence this may mean all the difference between securing and just losing business.

Those who are following up suggestions with regard to steam-raising and power production will do well to refer to the recent remarks of Mr. D. L. Selby-Bigge at a meeting of the Iron and Steel Institute. Waste heat utilisation is, of course, the attraction of the age, and there is no question that enormous opportunities exist for employing it in lieu of a portion of the fuel now consumed. Mr. Selby-Bigge is of the opinion that existing methods for the generation and transmission of electric power have reached such a high standard that only comparatively trifling economies can be expected in the engine-room or power house. Economies must, accordingly, be looked for in the boiler house and in the utilisation of such waste assets as blast-furnace gas, coke-oven gas, and gas from reheating and regenerative furnaces as applied to the raising of steam. Amongst a number of points suggested for attention are the reduction of labour, and economical burning of fuel by the use of efficient mechanical stokers; the purification, softening, and pre-heating of boiler feed water, and the development of markets to absorb the surplus power available from collieries and iron and steel works. Mr. Selby-Bigge supports the general opinion, moreover, that under certain conditions considerable economies may be expected from the adoption of powdered fuel for firing metallurgical furnaces.

The Levinstein Case

THE retirement of Dr. Levinstein from the management of the British Dyestuffs Corporation has excited more public interest perhaps than a personal incident of this nature usually attracts. It is due apparently to differences of opinion as to policy. From the published reports of his views Dr. Levinstein maintains that the company should have an expert technical director with full powers. Exactly what the term "full powers" means we are unable to say, but if the system which Dr. Levinstein advocates has been already in existence up to now the results might very well justify an experiment in another direction. As we understand the position, the policy now adopted is that of a unified control under Sir William Alexander. This principle was adopted in the conduct of the war at a late stage with excellent results. Its success depends largely on the selection of the right man. Sir William Alexander is admittedly an able organiser and administrator. His name is usually more associated with success than with failure. In this case he has undoubtedly a difficult job to tackle. For that reason he is the more entitled to encouragement and help, and to be freed from the additional difficulties which unnecessary controversy creates. He may be trusted to do all that one man can do to pull the position round, and is entitled to the loyal support of all who desire the success of British enterprise.

It is a little disheartening to notice the tone in which this matter has already been raised in Parliament. Some of the questions put in the House betray a feeling of something like exultation over the difficulties of a British company, employing British labour, and anxious to stabilise a new British industry. The failure of the Dyestuffs Corporation could bring no good to anyone except foreign, and especially German, competitors, as indeed the failure of any other British dyestuffs concern would do. In Berlin, where the progress of our dyestuffs industry is viewed with real concern, it would no doubt be welcome news. But in this country there ought to be only one attitude possible—and that an attitude of hearty sympathy and practical support towards every effort to strengthen the position of home production.

A Changing Attitude

CASES are reported to us which seem to indicate a more favourable feeling on the part of British merchant houses towards home productions than is sometimes imputed to them. One very large and reputable firm, we understand, has decided definitely not to handle German dyestuffs in competition with British goods and to co-operate heartily in successfully marketing the latter. Manufacturers, we believe, will appreciate this policy, which, if it extends, may result in a better feeling and closer relations between two classes who are both indispensable to the success of British trade. This policy is based on sound commercial reasons as well as on national sentiment. British industries appeal to one just because they employ British labour and pay British taxes, while foreign industries do neither; and our merchant houses can do much to support them by keeping the producer in touch with the consumer, advising him as to market requirements, and reporting any weaknesses in our own position. On the other hand, the majority of manufacturers, particularly the smaller classes who have not the resources to organise direct selling and distributing machinery, will find the merchant a helpful ally, and both may gain from an understanding to make the success of British industries their first concern.

On this subject we have received some pleasant acknowledgments of the advice we have ventured to offer as to the right policy in the present situation. We shall, of course, still be a large importing nation, for many of the things on which we depend come from other sources than our own. But what this country can produce it should be encouraged to produce. On that point there is hardly room for more than one opinion among those whose first desire is the prosperity of this country.

Points from our News Pages

"The Influence of Patent Law on the Evolution of Research" is discussed by Mr. Harold E. Potts in an article the concluding portion of which will appear next week (p. 726).

The Official Referee, in his final decision on the gas mantles inquiry, awards the Board of Trade and the National Gas Council their costs in the special case stated for the consideration of the High Court (p. 735).

The hearing of a complaint that boric acid has been improperly included in the Board of Trade's list of dutiable articles was opened before Mr. Cyril Atkinson, K.C., on Saturday, May 27 (p. 732).

Speaking at the annual meeting of the British Cotton and Wool Dyers' Association, Mr. A. Hoegger expressed his admiration for the co-operation of British dye manufacturers in the production of new dyes (p. 731).

A lecture by Sir George Beilby on "The Structure of Coke," was delivered before the London Section of the Society of Chemical Industry on Monday, and was followed by discussion (p. 736).

Sir Ernest Benn explains the aims of an important new commercial publication, the *European Commercial*, to be published by Benn Brothers, Ltd., from Vienna (p. 738).

Our London Market Report records a substantial inquiry for chemicals against home trade requirements, but the actual up-take is somewhat diminished (p. 745).

Our Scottish Market Report states that business has been fairly well maintained, while prices have remained steady (p. 747).

The Calendar

June 5	Society of Chemical Industry: Meeting. 8 p.m.	Burlington House, Piccadilly, London.
7	Society of Public Analysts: Ordinary Meeting. Papers by: J. C. Thresh, H. E. Annett, A. F. Joseph, W. Singleton. 8 p.m. Informal dinner. 6.30 p.m.	Burlington House, Piccadilly, London.
8	The Optical Society: Joint Conference between ophthalmologists and opticians on Spectacle Construction.	Imperial College of Science and Technology, London.
8	The Chemical Society: "Chemical and Physiological Properties." Dr. H. H. Dale. 8 p.m.	Institution of Mechanical Engineers, Storey's Gate, London.
19 to 23	Chemists' Exhibition and Empire Drug Trade Mart.	Central Hall, Westminster, London.
21	Society of Glass Technology Meeting. 2.30 p.m.	Sheffield.
July 4	Society of Chemical Industry. Annual Meeting.	Glasgow.

Influence of Patent Law on the Evolution of Research

By Harold E. Potts, M.Sc., C.P.A.

We give below the first chapter of an article by Mr. Harold E. Potts, one of our first authorities on Patent Law, on "The Influence of Patent Law on the Evolution of Research." The concluding chapter will be published next week.

THERE is an interesting passage in Bergson's *Evolution Créatrice*, in which he points out the remarkable disproportion between the results of an invention and the invention itself. It is the increased mastery over matter which benefits humanity much more than the immediate results. Although the inventor himself may have no thought beyond the solution of a specific problem, his success is relatively unimportant in comparison with the new ideas and feelings which the invention arouses; thus the invention enlarges our horizon by raising us above ourselves. The disproportion between cause and effect is so great that it almost appears as if the intelligence acts by releasing something striving to escape from matter—the vital impetus.

This view of intelligence suggests that we should be interested in chemical inventions not only as solutions of immediate problems but as the nuclei of further and much wider inventions arising out of them. We may say that the progress of chemical research and invention should proceed by auto-acceleration, as an exponential function of time. We see further that two conditions are necessary for the full effect to be felt:—

The Need of Publicity

(1) The results of research should be rapidly available to the public, and (2) the investigation of theory should not be neglected through preoccupation with a specific problem. The exponential rate of advance will thus be maintained by publicity and attention to theory.

Now, although these obvious requirements are fulfilled in academic research, they are apt to be overlooked in industry. Yet the volume of industrial research is so great, and the material resources of industrial experimenters are so lavish, that much of the pure chemical research of the future must take place in industrial laboratories. How, then, can the conditions of publicity and attention to theory be secured?

My object is to indicate that the patent system provides the necessary incentives. I shall interpolate a few remarks on the nature of invention itself. I propose to discuss the results of the patent system from the point of view of public interest, but I shall make a few incidental observations which will show that the interests of the industrialist and the research worker are also safeguarded by the patent system.

First, then, it is evident that the public interest demands the utmost possible publicity for the results of industrial research work. Secrecy not only causes overlapping, but it prevents the exponential rate of progress from being maintained, since it gives other workers no opportunity of using the results as the raw materials for fresh inventions in different industries or as data for theoretical investigation. The work of the Badische Company on the contact process for making sulphur trioxide was suggestive to all investigators of industrial catalysis, because of the light which it threw on the phenomenon of catalyst poisoning, and it was also important to the chemical theorist because of the data it supplied for the study of heterogeneous equilibrium.

The patent system encourages the desired publicity by offering the inventor a monopoly of his new process for sixteen years in exchange for an immediate full and accurate disclosure of his secret. While it is true that the public is thus restrained from using the invention without the consent of the inventor, it is found in practice that this restraint is a fair price to pay for the enormous benefit of receiving early and adequate disclosure of new discoveries. Although the inventor receives a monopoly, the public does obtain the benefit of the new discovery directly, since the inventor is able to do something more economically than it had been done before, or to obtain some new result. The public participates in these benefits, and it is only fair that the inventor should obtain some monopoly. But beyond the direct advantage, the scientific and technical public are at once enabled to utilise the data of the patentee in two ways.

(1) Research is stimulated to find an alternative solution of the problem which will not be tributary to the patent, so that the competitive spirit is fostered, and

(2) The general fund of technical knowledge is increased so that it is easier to evolve entirely different inventions.

Private Interests of Manufacturers

Probably these views will find general agreement, but it will be asked how the private interests of the manufacturer are served by this procedure. and whether he would not be better advised to attempt secret working. It would take too long to discuss adequately the relative advantages of patents and secret working, but it may be noted that, while there are cases in which secret working should be attempted, the prime objection to this procedure is the difficulty of preserving secrecy. There is grave danger of accidental or deliberate leakage of information, and at any moment it is possible that independent inventors may make the same discovery, when all chance of a monopoly will be lost to England, and the secret user may be actually shut out of foreign markets. The usual criticism of the policy of patenting is based on the alleged insuperable difficulties of proving infringement. In practice it may be observed that the law provides remedies for this difficulty, and infringement actions have been successful in which the defendants alleged that they were manufacturing by a secret process of their own, which they stated was not covered by the patent. In appropriate cases, the Court has the power to order inspection of the defendants' works by independent scientific men or others, or to order the defendants to answer certain questions as to what they are really doing behind locked doors. If necessary the Court will hear such cases *in camera*, but if there is any reasonable ground for suspicion the Court will undoubtedly protect the patentee by using its powers to investigate secret infringements.

As regards the research chemist, it will be agreed that if a policy of publicity is adopted, his professional status will be improved, since he will be able, and can be allowed, to publish his work more freely without injuring the employer. Once the invention has been patented, usually it will be possible for scientific publications to be made, which would be impossible under the system of secrecy. The friendly emulation produced by submitting the results of his work to the public judgment of his professional colleagues is one of the surest means of developing the professional spirit which we are all so anxious to foster among chemists.

Investigation of Theory

We have seen, therefore, that the patent system is of great importance in securing the publicity of research work, that it is undoubtedly desirable in the public interest, and that it appears of value to the individuals concerned. Let us see how it affects the second condition of successful evolution, namely, attention to theory. This is a more

complicated matter, which we can only consider after a brief examination of the requirements of the patent law in chemical inventions. It is necessary for the inventor to file a specification which describes his invention fully and adequately—this is the price he pays for his monopoly.

On the other hand, he must also define the area from which the public are excluded. Consider Knietsch's discovery that there was an optimum temperature of 430° C. for the oxidation of sulphur dioxide over a platinum catalyst. It would not have been fair to the public to state that he claimed oxidation at any temperature, because Lunge had previously proposed to work at a higher temperature. On the other hand, it would not have been fair to Knietsch to confine him to the exact temperature he described as being the best. Under these circumstances the law prescribes that a patent must contain a statement, called a claim, which defines what the inventor desires to keep for his own. Knietsch claimed a regulated moderate temperature,* which covered the essential feature, since careful temperature control is essential; the reaction is exothermic, and the yield falls off rapidly at high temperature, for reasons which are now thermodynamically obvious. At the date of the invention, however, it certainly was not known that an optimum temperature existed. The Knietsch contact process was therefore undoubtedly a patentable invention, although the novel feature was a limitation of temperature to the neighbourhood of 430° C.

It is thus necessary to describe the invention fully and to define its scope accurately. In so doing we must not claim anything which is already known, and yet we must use language wide enough to forestall infringers who will endeavour to escape from the patent by making ingenious variations.

Before we can do this we must obviously know what has been done before, because a patent can only protect something new. My experience shows that very few chemists realise the scope of the patent law in this connection. Probably everyone would agree that a patent would be obtained for the discovery that stainless steel could be made by adding 12 per cent. of chromium, that isoprene could be polymerised to rubber by using sodium as a catalyst, or that the vulcanisation of rubber could be accelerated by organic bases. It is not generally recognised that any new and useful result in chemical manufacture can be patented, and that the Courts sustain such patents as valid, provided that the result is not obvious. I wish to state with emphasis that the standard of the Courts is much lower than most chemists imagine. The following are a few examples :—

(*a*) Suppose that it was known that mixtures of ceria and thoria could be used for incandescent mantles. It was undoubtedly patentable to discover that one specific mixture, namely 99 per cent. ceria and 1 per cent. of thoria gave a vastly superior luminous efficiency.

(*b*) Generally, the discovery of optimum conditions in a known process is usually patentable if striking advantages are obtained, *e.g.*, the discovery that 430° C. was an optimum temperature in the contact process.

(*c*) The use of an apparently analogous reagent may be patentable. If a methyl compound is used for a certain purpose as a drug or dye, the process of obtaining the ethyl compound will be patentable if the result is much superior. Or, if a certain catalyst was known to assist the oxidation of anthracene to anthraquinone, the discovery that the catalyst gave a good yield in the oxidation of paraffins to fatty acids would probably be validly patentable since catalytic phenomena are not usually susceptible of prediction.

(*d*) Any novel condition of success usually justifies patentability. If a dyestuff is made by condensation, the discovery of a specially suitable condensing agent, or a special inert diluent may be patentable. In fact, analogy is such a broken reed in chemical argument that any new and useful result, no matter how little the conditions have been changed, should be carefully considered with a view to its patentability. It follows, therefore, that the research chemist is constantly making patentable inventions.

* In U.S.A.

A Wrong Idea

The usual idea of invention is that it is a mysterious kind of inspiration or the effort of an unusually powerful intellect. This is all wrong. Small inventions are made every day in the chemical laboratory, and can be produced almost by systematic routine. Great inventions are not usually made by rule, but as a large part of the useful work of the world must be done by those of us who are not so fortunate as to possess genius, more attention ought to be paid to the technique of invention and discovery.

In his recent book on *Physics*, Norman Campbell rather scoffs at the logicians and exalts the scientific imagination. This is all very well for the great discoveries, but I feel strongly that small discoveries, and important industrial inventions, can be developed systematically to a certain extent. The psychology of invention has not been fully investigated, but Ribot* has given an analysis which shows that the creative imagination depends on several factors :—

(1) Dissociation, or analysis of our ideas into their elements.

(2) Association of ideas which causes the dissociated mental elements to enter into fresh combinations which, like chemical compounds, possess properties which could not be foreseen from a knowledge of the properties of the elements.

(3) A principle of unity, a general idea which orients the mental process in a certain direction, and

(4) An emotional basis—enthusiasm accelerates invention.

Now it is certain that the process of dissociation can be performed logically, and that association of ideas depends on the possession of a varied store of scientific concepts and data. I suggest, therefore, that a technique of invention might be evolved as the result of a study of scientific method. This is a contentious subject, on which I cannot say more except to indicate that such an attempt would have to be based on logical principles and that a *post hoc* study of any of the pioneer inventions would not be so instructive as an investigation of minor ones.

In actual fact we do find that large industrial establishments are constantly making patentable inventions which are often the result of plan rather than of genius, but chemical invention would be more common if chemists realised that the smaller type of invention can probably be produced by system, and is certainly capable of protection by patents.

* Essai sur l'Imagination créatrice.

Potash Discovery in Texas

THE discovery of potash in notable amounts in a new area in Texas is announced by the United States Geological Survey. The new discovery is brought to light through the analysis by the Survey of drill cuttings collected from the Santa Rita No. 1 well, drilled by the Texon Oil and Land Co., in the southwest corner of Reagan County, Texas. Most of the samples contained no potash worth noting, but the sample which, according to the driller's log, was taken after drilling from 1,150 to 1,165 ft. contained the equivalent of 2·46 per cent. of K_2O; that from 1,175 to 1,182 ft., 5·63 per cent.; 1,155 to 1,265 ft., 5·65 per cent.; 1,265 to 1,275 ft., 2·50 per cent.; 1,275 to 1,283 ft., 6·38 per cent.; 1,283 to 1,293 ft., 7·88 per cent.; 1,293 to 1,300 ft., 4 per cent.; 1,310 to 1,316 ft., 2·05 per cent., and 1,316 to 1,325 ft., 8·29 per cent. K_2O. This, the richest of the samples, indicates 10·78 per cent. of K_2O in the soluble salts when 1 gram of the dry rock is dissolved in 100 c.c. of water.

Reviews

COLLOID CHEMISTRY OF THE PROTEINS. By Dr. WOLFGANG PAULI. Translated by P. C. L. THORNE. Part I. London: J. & A. Churchill. Pp. 140. 8s. 6d.

Dr. Pauli's book is virtually a monograph supporting the contention that proteins are ampholytes giving in alkaline and acid solutions true salts of weak acids and weak bases respectively. There is little to be said for this view that Dr. Pauli does not say. The treatment is thorough and detailed, and no worker in this section of physical chemistry can afford to neglect the volume. The author has drawn largely on the publications of himself and his collaborators, and has included such numerous excerpts from other literature as are germane to his purpose.

One has the uncomfortable feeling, however, that the views of other experimenters at times are hardly given due credit, that the author is rather protagonist than judiciary, and that it might have been wiser to have included more of the data of other workers and disproved their opinions than to have dismissed them. Further, in dealing with a subject that is highly controversial, it is disconcerting to a critical student or researcher to find at least seven important references to unpublished work by the author—some of it apparently ten years old. On the other hand, statements of moment are included, *e.g.*, the nitrogen content of amino acids on page 87, for which references could have been quoted with advantage.

Mr. Thorne's work of translation is excellent; one would not suspect it of being a translation, so free is it from the cumbersomeness of the foreign idiom, though we think that the spelling of the various amino acids, *e.g.*, ***alanin***, etc., should have been made to conform to customary English practice in the matter of the terminal vowel. Lastly, the proof reading has been careful, and the book is pleasantly free from the careless misprints that so often mar chemical literature of to-day.

D. I. J.

OILS, FATS, AND WAXES. By J. LEWKOWITSCH (the late). 6th edition. Revised by G. H. WARBURTON. London: Macmillan & Co. Pp. 946. 42s.

The present volume consists of two chapters. The first, dealing with the commercial preparation of the raw materials used in the industries concerned with oils, fats, and waxes, is an essay extending over 39 pages. The second deals with the chemical characteristics of the individual members, and fills the rest of the volume. The contents, therefore, are such that no very striking alterations and additions are to be expected, since the main lines of development during the seven years that have elapsed since the last edition have been in the industrial utilisation of oils, a subject which comes within the scope of the third volume of Dr. Lewkowitsch's treatise. The reviser has kept himself strictly to the plan of the author, and references to work published since the last edition, together with data concerning oils which have been examined by the chemist since 1914, have been added.

The enthusiastic specialist may, perhaps, think some developments deserve more than a passing reference, as, for instance, the hydrogenation of fish oils (particularly whale oil), which is dismissed in the phrase: "Considerable quantities are hydrogenated for use as edible fats." But in view of the fact that in this, as in other cases, the developments are largely still awaiting the test of time, it was wise of the author to refrain from elaborating the subject and making this volume mainly a compilation of data.

Glancing through the list of oils which have been added, those interested in their technical application will notice that substantial additions are due to Japanese investigations on the oils obtained from the fish peculiar to their coast, and will speculate as to the possible directions in which the most energetic and remarkable Oriental race will apply the information it is so industriously accumulating. He will also probably speculate as to the possibility of utilising what Lewkowitsch terms the lesser known oils. So far, it appears that once they have been analysed and their constants determined they cease to excite attention, and that in improved methods of cultivation and utilisation of the principal oils such as linseed, cotton seed, etc., among the vegetable oils is to be found the most profitable employment of the technologist's ability. "Tung" oils are practically the only oils which can be described as recently proved valuable additions to our supplies among the vegetable group.

Oiticica oil certainly has interesting properties, but so far has not attracted the attention of the industrial world. Time alone will show whether this indifference to new oils is justified, but, in any case, it is a great boon to have between two covers such a store of information, and Dr. Lewkowitsch will always be remembered with gratitude and admiration as the man who first supplied it. In bringing the work up to date the editor has earned the thanks of all who are interested in this subject.

T. H. B.

CHEMICAL ENGINEERING. By E. HART. U.S.A., Easton, Pa.: Chemical Publishing Co. Pp. 241. $4.

This should prove a very useful reference book in chemical works. A good deal of matter is taken from catalogues, but it would make the book much more useful if when particular makes of apparatus are illustrated a list is given at the end of the chapter of other manufacturers of similar plant. The book is not as useful for British users as it might be, as practically all the manufacturers mentioned are American. There are very interesting and useful chapters on high silicon iron and also on corrosion. The descriptions of boilers could have been materially curtailed and those of building construction omitted, in order to make more room for descriptions of actual chemical plant and apparatus that is in everyday use in chemical works.

More care might have been taken in the description of the plants. For instance, the chapter on "Evaporation" (section 211), describing multiple effects gives a hypothetical case for the conversion of three singles into a triple effect which would be liable to lead the average users astray, because in the hypothesis figures for the singles are taken which would never exist in any average chemical works, and consequently the conclusions arrived at tend to mislead users. It must be admitted that this is a very difficult action to explain, but is worth a little more care.

There are several very useful tables embodied in this book, and particular attention may be drawn to that given on page 110, in which the power requirements are given for driving turbine and ordinary stirrers for causticisers and dissolvers. The book has a great many features, and is useful for reference.

J. ARTHUR REAVELL.

THE ANALYSIS OF FUEL, GAS, WATER, AND LUBRICANTS. By S. W. PARR. New York: McGraw-Hill Book Co. 1922. Pp. 250. 12s. 6d.

This book has now reached its third edition, previous issues having appeared in 1911 and 1916, and it has been expanded to admit of its being used as a text book for students of chemistry and chemical engineering. The previous edition was chiefly intended for the use of mechanical engineering students. This accounts, perhaps,

for the somewhat wide range of subjects which has been treated in a single volume of 250 pages. The book is divided into two parts, the first being based upon lectures given in the University of Illinois. The second part deals with analytical methods and laboratory procedure. Chapter II, which is on coal, would have been better if some mention had been made of the coal production of other fields than those of the United States. An exclusive attitude is noticeable throughout the book, and the references might lead the uninformed to believe that the only important information available on the entire subject of fuel was that from American sources. Coal forms the subject of a large portion of the book. Sampling, analysis, and the drawing out of specifications for coal are treated at some length. No reference is made to Seyler's method of classification, which is superior to, and better known, than the method given in the book.

The subject of liquid fuels receives four pages in the first part of the book, and one is led to think that it would have been better to omit the section altogether. The statement that the chief tests required are the sulphur test, water, heat value, and fractional distillation is incorrect and misleading. It is to be feared that after reading this section the students would provide an example of the proverb that " a little knowledge is a dangerous thing." The lubricating section is much more satisfactory, and should give students an elementary conception of the testing of lubricants. The wording of the book is concise, and it should be of assistance to engineering students. At the same time, the diversity of subjects treated has made it impossible to give in the various sections a certain amount of valuable detail. The book is well printed and strongly bound. H. M.

"A Flank Attack"

To the Editor of THE CHEMICAL AGE.

SIR,—May we offer to you our congratulations on your Editorial Note under the above heading. You make a very apt allusion as to what the position would be were it a question of importing cheap German labour instead of cheap German instruments, and we trust that your article will be brought to the notice of the various Labour members, as they seem so desirous of purchasing goods in the cheapest market irrespective as to the ultimate result of their efforts. It is, perhaps, a little difficult to think back to those early days of August, 1914, and realise to what a tremendous extent we had allowed the Germans to invade us by peaceful penetration, and it was only through the almost super-human efforts of the various manufacturers that this country was able to hold its own. When one considers the terrible loss of life in the earlier days of the war through the inadequate supply of high explosives and the other necessary material, to say nothing of the loss sustained by this country from a monetary point of view, it seems almost incredible that some men of business are ready to risk the repetition of such a catastrophe.

The lesson which this war has taught us should have been sufficiently impressed upon our minds as to have made it impossible for anyone who passed through the terrible years of 1914–1918 ever to contemplate for one moment a repetition of such events. Quite recently the Press was full of information in regard to the visit of His Majesty, the King, to the various cemeteries in Belgium, where mortal remains rest of those gallant men who stood between us and the German invasion. It would almost appear that their sacrifice is forgotten in the greed for profit.

Should we be faced through the next decade or so with another war, it will be of a far more intense character from the scientific point of view, and one doubts whether we shall be given the same opportunity to protect ourselves as we were in the past; certainly we should not deserve it, and the Government of that period could not be surprised if manufacturers did not come forward with the same alacrity as in 1914—to say nothing of the fighting men.

We trust you will continually keep your point of view well before your readers so as to let them realise the hidden danger in once more becoming dependent upon Germany for some of our most essential supplies.—Yours, etc.,

M. DUNBAR, Director
(for L. Oertling, Ltd.).

London, E.C.1.
May 25.

"Closing the Profession"

To the Editor of THE CHEMICAL AGE.

SIR,—I have read with interest your current editorial article on the closing of the chemical profession. The lack of legal status, co-ordination, and corporate discipline in the chemical profession, as shown by your article, can be attributed directly to the following reasons :—

First of all, to the widely opposed views held by sections of the profession of what constitutes a chemist. Different standards have been set up by the various chemical organisations throughout the country, and until some consensus of opinion can be arrived at no material progress in regulating the profession will be achieved.

Secondly, the difficulties to be overcome are further increased by the ambiguity of terms and misapprehension existing in the public mind due to the assumption through long usage and statute of the title " chemist " by a large section of the pharmaceutical profession. Much opposition is to be anticipated from the chemist and druggist and proprietors of multiple " cash chemist " establishments to any proposals put forward for securing, by force of statute, a legal status to the chemical profession.

Further—and this is more regrettable—there is the unaccountable apathy encountered among chemists when efforts are made to organise them for the consideration of this and similar questions. Large numbers of chemists are extremely loth to bestir themselves to attack the vital problems connected with their profession. At a conservative estimate, not more than 20 per cent. of the chemists of the country are members of either the Institute of Chemistry or their professional associations.

The legal re-definition of the term " chemist " and the raising of the status of the profession are among the foremost objects of the British Association of Chemists, and many recent attempts have been made (though I regret so far unsuccessfully) to form a committee from among the various interested organisations for preliminary consideration of the whole position.

Much attention to this has been given by my Council and its recommendations may be briefly summarised as follows :—

(1) That a Joint Council be formed consisting of representatives of the Universities, the Chemical Society, the Institute of Chemistry, and the existing professional associations to fix a standard minimum qualification for chemists, to be approved subsequently by H.M. Privy Council, and to regulate the entry to, and conduct of, the profession on similar lines to the Law Society and the British Medical Association.

(2) That the Pharmacy Act (1868) be amended in such a way that after an agreed date all terms contained therein specifying " chemist," " chemist and druggist," etc., shall be interpreted as " pharmacist," " pharmacist and druggist," etc., and that thereafter the term " chemist " shall apply only to such persons as hold the standard minimum qualification and whose names shall appear in a statutory register of chemists.

I submit that, unless and until these or similar proposals are adopted, chemistry will never rank with medicine or the law as a profession in the eyes of the public.—Yours, etc.,

S. REGINALD PRICE,
General Secretary British Association of Chemists.

London, May 30.

A Query for Oil Experts

To the Editor of THE CHEMICAL AGE.

SIR,—A peculiar deposit has reached me which appears to be an immense mass of resiniferous matter absorbed by the soil from the decomposed conifers of the ancient forests. This substance occurs in great quantities, and from it can be easily distilled a large percentage of resinous substances.

What makes the occurrence so interesting is its immense quantities, its ease of treatment, and the apparent fact that, having been subjected to certain sub-surface conditions for ages, it differs in characteristics from the resin oil of commerce and is far more aromatic.

The reason I am writing you is that I do not know where to turn for a possible market. I will gladly send a sample of first run, which contains all the elements of distillation, but am of the opinion that some of your readers may be looking for just such an oil, which I feel sure can be put on the market for less than the ordinary oils obtained from the turpentine forests. I will send analysis or other information required, but I need someone who can make use of the oil to look into the matter for factory use. I presume it may be termed a "petrified resin," more like a mineral than vegetable. Anything you can do through your valuable journal will be highly appreciated.—Yours, etc., E. S. Estlin.

British Columbia United Oil Co., Ltd.,
Vancouver, B.C.

The "Packed Cell" Process

To the Editor of The Chemical Age.

Sir,—We have carefully read through the article in "Chemical and Metallurgical Engineering," referred to in your issue on March 27, and we cannot find any material difference between this process and the Opl tower system for producing sulphuric acid which originated in Austria more than ten years ago, and was installed on the Continent and by ourselves in this country without its, however, having succeeded in gaining favour to any extent among sulphuric acid makers either here or abroad.

For a new departure to compete successfully with a chamber plant it must show pronounced saving in the capital cost and running cost. If these costs are the same as those of the chamber plant or only slightly less, the inducement is not sufficient for the manufacturer to make any change in favour of an intensive such as the Opl tower or the "Packed Cell" which are very much more sensitive to changes than the former, and require much more careful manipulation.

As a consequence of the greatly increased amount of work allotted to each cubic foot of reaction space the two bugbears of these systems are, firstly, the dust which accumulates in the packing and rapidly reduces their efficiency; and, secondly, the difficulty of saving the large floating stock of nitre circulating in the towers should the leading producing towers fail to cope with their work through some passing disturbance, such as a stoppage in the circulation or in the cooling system of the nitrous vitriol. In such cases the temperature in the end towers rises rapidly, and unless immediate and drastic measures are taken the amount of nitrogen oxides liberated and passed on to the end towers is too large for them to absorb, and a heavy nitre loss is the result.

The chamber plant, by contrast, shows a much greater elasticity, and can be "pulled round" more easily and without incurring heavy nitre losses. Dust accumulating in the Glover packing does not affect the productive capacity of the plant to anything like the extent it does in a system depending on packed towers only.

An Opl tower plant to produce 18 tons of 78 per cent. acid per 24 hours consisted of:—

2 towers 9 ft. by 9 ft. by 40 ft.
2 towers 9 ft. by 11 ft. 2 in. by 40 ft.
2 towers 9 ft. 11 in. by 13 ft. 7 in. by 40 ft.

This is admittedly cut too fine, and in the "Packed Cell" process the reaction space has been increased; a plant to produce 20·3 tons of 78 per cent. acid per day is shown as consisting of:—

5 towers 15 ft. by 7 ft. by 40 ft.

to which must be added:—

1 Glover, 12 ft. by 12 ft. by 40 ft.
2 Gay-Lussac, 6 ft. by 13 ft. by 40 ft.

Before the war the Opl tower plants could be erected at a cost that certainly was below that of the chamber plant, but with the present prices of acid proof bricks, packing, railway carriage and labour, we cannot see how a "Packed Cell" plant could be built 40 or 50 per cent. cheaper than a chamber plant.

We do not know of any case where the cost of operation has been less than that of a chamber plant, the running costs of which have in most cases been cut down to a bare minimum. Another drawback of the towers is the large amount of cooling water, 50,000–60,000 gal. per 24 hours are spoken of for a 20-ton "Packed Cell" plant, and last but not least, tower plants provide no storage facilities for low grade acid, a *sine qua non* for the seasonal fertiliser industry.

There remains the advantage of the smaller ground space in favour of the tower systems, be they called "Packed Cells" or Opl towers. We are inclined to think that this advantage may be largely reduced by increasing the output of existing chamber plant by such means as the Packard chamber or the new "splash box" (Schmiedel) process.—Yours, etc.,

H. J. Bush.
Huntington, Heberlein and Co., Ltd.,
18, Iddesleigh House, Westminster, S.W.1.
May 30, 1922.

United States Chemical Industry

A New Manufacturers' Organisation

The American Chemical Industry is gradually eliminating the obstructions that nearly always appear in the path of a new and rapidly growing industry. These stumbling-blocks are the natural results of individual effort that is not standardised. For instance, every producer of chemical equipment gives a special name of his own to the products turned out by his factory. The result is that prospective purchasers are frequently confused by the different names of the similar products put out by several manufacturers. Designed to solve such problems, the recently formed Chemical Equipment Association, at a recent meeting at the Chemists' Club, New York, formally adopted by-laws and outlined a plan of action.

The objects of the Association are to: (1) Encourage high standards in the chemical industry; (2) promote a better knowledge of conditions controlling the industry's development; (3) take steps to bring about definite understanding as to professional services rendered to purchasers in connexion with the sale of equipment; (4) investigate conditions surrounding the resale of equipment originally produced for specific purposes; (5) disseminate information as to methods of arriving at correct costs; (6) standardise trade phrases; (7) collect and disseminate information as to design, raw material and construction; (8) take suitable and timely notice of, and action upon, matters of legislation, both national and State, which affect the members of the Association; (9) collect and disseminate market statistics both domestic and foreign; (10) collect and disseminate information as to labour conditions and relations; and (11) enter into such other legitimate trade association activities as may be deemed in the interest and welfare of the industry.

The Association made a particular point in its by-laws of the fact that it would not undertake any activity which would restrain trade, limit production or competition, or regulate prices. It is the fourth organisation set up for the service of the chemical industry of the United States of America. The synthetic organic chemical manufacturers, the manufacturing chemists and the scientific instrument makers already have organisations of their own, the Chemical Equipment Association being particularly devoted to the problems of manufacturers of chemical process equipment.

One of the chief difficulties that have been encountered in the past concerns the matter of technical service in installing equipment in plants. For example, when a purchaser orders equipment from a manufacturer it is usually necessary for a technical man to go to the plant properly to install the new equipment; also to give instruction in the care and operation of such equipment. There has been in the past confusion as to the proper method of charging for such service, and the new organisation will standardise just charges in such cases. An equal amount of difficulty has arisen over the resale of chemical process equipment manufactured for specific purposes. The handling of second-hand machinery of this character has in many cases fallen into the hands of men who know nothing about the manufacturing of chemical equipment. Through the Association the heavy equipment manufacturers will endeavour to protect themselves and their customers by determining some new and better method of handling such second-hand materials.

The Price of British-made Dyes

The Users' Point of View

REFERENCE to the high cost of dyes was made by Mr. A. Hoegger (chairman) at the annual meeting of the British Cotton and Wool Dyers' Association, Ltd., held at Manchester on May 24. Speaking in regard to the present dye position, Mr. Hoegger said that consequent upon the disappointment of consumers at not obtaining many of the colours required, considerable dissatisfaction had been felt by them and, had trade revived to the extent expected, the situation would have been far more acute. Perhaps the most serious matter was the delay and the injurious effect which this had upon the dyeing industry. In many cases also there had been just cause for complaint in respect of substitutes—offered in place of colours for which licences were refused—being quite different from the actual dyestuffs required. Sometimes a mixture of two or more dyes had been put forward as a suitable substitute for a self colour. Such mixtures were usually very unsatisfactory, and led dyers into all sorts of trouble with their customers, which involved claims and consequent heavy losses. It was, however, only fair to say that licences had been freely granted where a consumer had furnished evidence that a specific substitute was unsatisfactory for his particular purpose.

In the granting of licences, continued Mr. Hoegger, the question of price had hitherto scarcely been taken into consideration by the Licensing Committee, although it was recognised that the British dyestuffs industry ought to be established without placing the textile and other colour-using industries in an unduly disadvantageous competitive position. It was well known that dyes could be obtained from Germany at very much lower prices than those charged for corresponding colours by British makers.

German and Swiss Dyes

It had been repeatedly stated that Germany was charging to-day exorbitant prices for colours which were not made in this country; but, as far as their Association was concerned, he, personally, did not know of any such cases. In this connexion he had had representative lists prepared by their Drug and Stores Department, which conclusively proved that many of the statements made both inside and outside the Houses of Parliament were not borne out by their experience. They showed, for example, that of thirteen German dyestuffs, of which no equivalents were made in this country, present prices were from two and a half to seven times those of pre-war. In the case of sixteen British-made dyes, present prices ranged from three to twelve and three-quarter times the approximate pre-war prices. Twenty-four Swiss-made dyestuffs showed present rates to be from five to twelve times the approximate pre-war price. Whilst the present German prices of fourteen dyestuffs, of which equivalents were now made in this country, varied from two to seven and a quarter times pre-war prices, the British equivalents varied from two and a half to twelve and a half times German pre-war prices.

Dealing with the granting of licences for the importation of foreign dyes, the Chairman said that, notwithstanding complaints which had been made, published statistics showed that licences had been granted for quite a large proportion of the total amount of colours applied for under the Act. During the year 1921 applications were made for 1,900 tons of dyestuffs, and licences were granted for 1,195 tons, valued roughly at about £1,050,000, which amount would work out to an average price of 7s. 10d. per lb., or, roughly, to eight times pre-war figures. Of applications for Swiss dyes (as regards total quantities) 78 per cent. were granted, whereas only 46½ per cent. of applications for German dyes were allowed.

Co-operation of British Dye Manufacturers

As the Dyestuffs (Import Regulation) Act, 1920, had still nearly nine years to run, it was hoped that during this period of prohibition, except under licence, the British dyemakers would make their position self-supporting. Quite a number of British-made dyes had been introduced during the past year which were not previously made in this country, and many others had been improved. In this connexion he expressed his admiration and thanks for the great assistance and help rendered to the Association by the various dye makers of this country. No doubt continued efforts would be made by them gradually to produce dyes of only the highest quality and regularity.

British Dyestuffs Corporation

As large shareholders in the British Dyestuffs Corporation, Ltd., and with all due respect for the high business qualities of the members of the board of directors, Mr. Hoegger ventured to suggest that the sooner a manager possessed of the best possible chemical knowledge, technical training, and great experience in the dye-making industry was put at the head of affairs, the better it would be, not only for the colour-using community of the country, but also for the shareholders of the British Dyestuffs Corporation. The success of the German and Swiss colour works was due entirely to having men at the head of affairs who were unexcelled in technical training and experience. The highest talent was required, and the greatest possible efforts must be made in perfecting our dye-making industry, if we wished to retain our former supremacy in the textile trades of the world.

Low Temperature Carbonisation

Professor Armstrong on the Barnsley Experiments

LECTURING on Tuesday at the annual meeting of the Manchester and Salford Sanitary Association, Professor H. E. Armstrong said the problem of producing smokeless, cleanly fuels, suitable for general use, had now unquestionably passed into the final experimental stage and was ripe for practical application.

His view had long been that the gas companies should lead the way and become purveyors of both solid and gaseous fuels. Their position was, he said, most critical; they would not be able to afford to make "straight" coal gas when the price of their hard coke fell, as it must fall as soon as the low-temperature product came on the market. They would be wise if they were first in the market with this.

The disabilities attending the use of raw coal, continued Professor Armstrong, were greatly diminished, if not entirely overcome, if coal were first washed and then subjected to carbonisation at a low temperature. During and since the war he had been in closest touch with the development of the low temperature carbonisation industry, and was therefore qualified to give an opinion on the results thus far achieved. In the report of the Smoke Abatement Committee the Barnsley process was spoken of as in the experimental stage. If this were taken to mean merely that it had not yet been adopted anywhere in practice, it was correct, but it implied very little as to the actual position. Experiments might be either successful or unsuccessful; there might be much or only little to be learnt to make the process under study fit for commercial and industrial application; it might be necessary merely to establish what were the best dimensions to be given to the plant and the most favourable conditions to be observed in working practice. He believed this last to be now the proper description of the position.

Combustibility of Fuels

Much progress had been made of late in the study of conditions which determined the combustibility of fuels. The South Metropolitan Gas Company had succeeded in producing a smokeless fuel, burning in a by no means unsatisfactory manner, from ordinary hard gas coke by grinding it to a powder, mixing this with an equal weight of fine bituminous coal, and carbonising the mixture at a low temperature. Mr. E. V. Evans and his colleagues had shown that if coal were reduced to a fine powder, then compressed under a pressure of ten tons per square inch and carbonised, a coke might be produced of remarkably uniform structure with the combustibility of charcoal. It would seem to be possible to produce smokeless fuels of any required degree of combustibility by modifying the conditions of carbonisation so as to leave more or less volatile matter in the residue. The experimental plant at Barnsley had been in regular operation, with such effect that about 4,000 tons had been produced of a "coalite," which had found a ready sale at prices superior to that of coal. From personal experience he could testify to the superior value of that fuel, although that which he had had gave an undue proportion of ashes, owing to the use of an unwashed coal.

Safeguarding of Industries Act

Opening of the Boric Acid Inquiry

THE hearing of a complaint that boric acid has been improperly included in the list of articles chargeable with duty under Part I of the Safeguarding of Industries Act began on Saturday, May 27, before Mr. Cyril Atkinson, K.C., the Referee. The complainants were the Chemical Merchants' and Users' National Vigilance Committee, represented by Mr. Kenneth Swan and Mr. R. L. Parry, and the opponents were Messrs. Howard and Son, of Ilford, H. Coghill and Son, Ltd., of Newcastle, Staffs, G. H. Poole and Son, of Bootle, and Joseph Townsend, Ltd., of Port Dundas, Glasgow. The Board of Trade also opposed. The four firms mentioned were represented by Sir Arthur Colefax, K.C., and Mr. S. Cripps. Mr. Whitehead again appeared for the Board of Trade.

The Complainants' Case

Mr. Swan said that the case for the complainants was that the Board of Trade had improperly included boric acid in the list on the ground that it was a fine chemical. There were three formulæ for boric acid, namely, H_3BO_3, $H_2B_2O_4$, and $H_2B_4O_7$. Boric acid had been known for two centuries, and had been found in the natural state in many volcanic districts, especially in Tuscany. The first important plant for the production of boric acid was established in Tuscany by Mr. Larderello in 1818, for the extraction of the natural acid from the volcanic springs and steam jets which occurred in that district. The boric acid exported from Italy was that with which they were largely interested in this inquiry; this came wholly from the Larderello district of Tuscany. Various competing firms had been formed to develop the natural resources of that district, but these were amalgamated later into the Societa Boracifera di Larderello. Boric acid was also obtained from borax, another naturally occurring product found in many parts of the world by a simple process of acidification. So far as he knew, boric acid was not imported into this country from any other source than the Larderello district of Tuscany, and that was the boric acid upon which the duty would fall if boric acid remained in the list. It was produced in various grades of purity, the commercial quality being 99·5 per cent. pure. There was a crude boric acid of 82 per cent. purity, and another quality of 95 per cent. purity, but that which was imported into this country was the 99·5 per cent. grade. Since the passing of the Act, the importation of the 99·5 per cent. boric acid had been almost entirely stopped, and the cruder acid had been practically the only boric acid imported since.

Replying to the Referee, Mr. Swan said that until four months ago all the acid which came into this country, whether crude or not, was known as boric acid; therefore, the list covered both grades. He understood, however, that the Board of Trade was anxious that a duty should not fall upon the crude acid, and a suggestion had been made that the crude boric acid should not be called boric acid at all, but should be imported under the name of sassolite, for the purposes of differentiation, in order that the tax should not fall upon the crude acid. That, however, did not enter into the case. The Referee had to consider whether 99·5 per cent. boric acid was a fine chemical or not. This came into the country in three forms, as crystals, as a powder, and in a special form called paillettes, a form of crystal resembling straw.

Boric acid was largely used for preservative as well as for pharmaceutical and antiseptic purposes, whilst the many industrial uses included the pottery, glazing, enamelling and glass trades, metallurgy, the leather industry, paper making, etc., and a considerable quantity was converted into borax. The Board of Trade had, in their counter-statement, made a very considerable point of the pharmaceutical and medicinal uses, and apparently went so far as to say that because it was used for those purposes it was a fine chemical. It was stated in the British Pharmacopœia that when used for pharmaceutical purposes boric acid must be of a purity of 99·5 per cent., with not more than 25 parts of lead per million and 5 parts of arsenic per million. Borax also had to be of a purity of 99·5 per cent., the lead and arsenic limits being 5 per cent. in each case.

Trade Witnesses

A number of trade witnesses were called, and followed each other in quick succession. Mr. David S. Paton (Kirkpatrick, Barr and Paton, chemical merchants, London), Mr. Charles Bell (proprietor and founder of Charles Zimmermann and Co., chemical merchants, London), Mr. S. J. C. Mason (Bush, Beach and Gent, Ltd., chemical merchants, New York and London), and Mr. P. J. Kuhne (market clerk to Victor Blagdon and Co., Ltd., chemical merchants, London) all referred to their long experience of the trade, and stated that they had always regarded boric acid as a heavy chemical. Trade journals were referred to to support this contention.

The cross-examination of these witnesses was directed to show that very little business had been done in boric acid in the home market for some time past, so that they were not speaking with real knowledge of the trade at the moment. Practically all the witnesses agreed that boric acid constituted a very small part of their whole business at the present time.

Italian Works' Managing Director

Mr. Ugo Funazoli (managing director of the Societa Boracifera de Larderello, Florence, and director of the electrical department of the company) said that his company owned the plants for the production of boric acid from the natural springs in Tuscany. There were eight spots at which works had been erected, but the proportion of boric acid in the water was very small, from 2 to 4 parts per thousand. In order to obtain the boric acid, the water or condensed steam was passed through a series of narrow, lead-lined receptacles, placed in cascade formation, the water travelling from the top basin to the lowest. Evaporation went on the whole time, the basins being heated by natural steam jets underneath. If the water were sufficiently pure, as was the case in several of the spots mentioned, the water could be concentrated to about 12 per cent. of boric acid, and the acid which crystallised out was of 99·5 per cent. standard. Crystallisation was effected by allowing the liquid to cool, and decanting the water, leaving the crystals in the tanks, from which they were recovered. After the first crystallisation, the liquor which was drawn off was recrystallised, giving a second crop of crystals, which were less pure than the first, and this could be repeated several times, the purity of the boric acid becoming less and less, the lowest being about 55 per cent. pure. The company did not confine themselves to the production of boric acid. They also made borax, and there were a number of by-products from which carbonate of ammonia and perborate of soda were made. There was one highly skilled man looking after the whole of the eight plants, which sometimes were 15 miles apart, and there was no qualified chemist. During the war the company exported something like 80 or 90 tons of boric acid per month to the United Kingdom, and he thought the export was on about the same scale previously, although he himself had only joined the company in 1912. Crude boric acid was of a purity of 82 per cent., produced by mixing the proper proportions of the 95 and 55 per cent. products, and large quantities of 82 per cent. boric acid had been sold in the United Kingdom. The commercial product was the 99·5 per cent. acid, and the crude was always invoiced as 82 per cent. Unless the customer asked for crude, it would be understood that he required the commercial, or 99·5 per cent. The crude was now invoiced as sassolite, at the request of Borax Consolidated, Ltd., to whom all their product was sold in this country.

Board of Trade's Definition

Mr. Swan put in a letter received by the Italian Commercial Embassy, from the Department of Industries and Manufactures of the Board of Trade, which stated that: "Borax is dutiable only when 'R' quality. ('R' indicates generally that the article so marked in the list is of a higher grade of purity than the grade or grades ordinarily used in industry). Boric acid is dutiable even in its commercial form, that is to say, containing about 99·5 per cent. of boric acid. Crude Tuscany boric acid containing 82 to 85 per cent. of boric acid is not dutiable, being a crude mineral product."

Sir Arthur Colefax, cross-examining, put a number of questions with regard to the percentage of boric acid in sassolite, but witness could not answer, stating that he was not a chemist.

Cross-examined by Mr. Whitehead, witness said that his company were anxious to do business in the 99·5 per cent. product, because it was more profitable. Counsel then pointed out that the company had exported a larger proportion of crude boric acid before the war than refined, and suggested that that was due to difficulties in refining, but witness said the process of refining was simple; the process involved a great deal of labour, however, which had become increasingly dear.

Mr. E. J. Parry

Mr. E. J. Parry (consulting chemist) agreed substantially with Mr. Funazoli as to the method of production, but disagreed with him when he stated that the elimination of arsenic and lead could be effected by crystallisation. Any process for removing lead and arsenic would have to be the same as that used for removing these impurities from other chemicals. He had examined many samples of boric acid, and had no doubt that the 99·5 per cent. product contained more lead than the B.P. standard allowed. He had no doubt that boric acid was a heavy chemical. It was used in the manufacture of Pyrex glass, a heat-resisting glass containing up to 7 per cent. of boron oxide, the boron counteracting the coefficients of expansion of the other elements of the glass. It was also used for enamelling, glazing, etc., and a quantity was converted into borax. Borax and boric acid were, in the trade, and in most scientific literature, never separated, and in many cases trade users could take borax or boric acid under the same contract and at the same price. With regard to the allegation in the Board of Trade's counter-statement that 80 per cent. of the boric acid used in this country was absorbed for medicinal and surgical purposes Mr. Parry disagreed.

Questioned by the Referee as to the method of manufacture here, Mr. Parry said that boric acid was made from borax, by solidifying and setting free the boric acid and removing the lime compounds and other impurities, and recrystallising, removing the arsenic and lead, and redissolving and crystallising and purifying. He hardly thought it was going to be said that the manufacture here was of such a nature that it should be regarded as a fine chemical, because the process was not that of a fine chemical.

Answering questions by Sir Arthur Colefax, with regard to the method of manufacture in this country, Mr. Parry said that the nature of the process was quite common property. There were, no doubt, difficulties to be overcome, but they were not difficulties of the kind which would raise the manufacture to the manufacture of a fine chemical. So far as he knew, boric acid had not a single character in common with a fine chemical, except that it could be obtained in a state of great purity.

Replying to the Referee, Mr. Parry said he could not say anything with regard to the plant used, except that there could be used none of the plant with which they were familiar in the manufacture of fine chemicals.

"The Chemical Age" Market Reports

A number of price lists and catalogues, directories and trade journals were then dealt with, as showing that boric acid was regarded in the trade as a heavy chemical. Amongst these THE CHEMICAL AGE was prominently referred to. In the issue for January 7, 1922, boric acid and borax were dealt with under the heading of "Industrial Chemicals." These substances always came under industrial chemicals. Asked whether there was a heading "Fine Chemicals," Mr. Parry said the headings in the market report he was referring to were "general chemicals," "coal tar intermediates," "coal tar products," "chemicals," and in the Scottish market reports "industrial chemicals," "coal tar and wood distillation products." THE CHEMICAL AGE was not a paper usually devoted to fine chemicals. The industrial chemicals were typically heavy chemicals; boric acid and borax were quoted among typically heavy chemicals, but it was not stated that they were heavy chemicals.

Answering further suggestions, that he did not know what skill and chemical supervision was necessary in the process for making boric acid from natural borate in this country, Mr. Parry said he was satisfied that it did not require anything approaching the skill and supervision necessary for the manufacture of bodies known as fine chemicals.

This completed the complainants' case.

Opening of Opponents' Case

At the second sitting, on Tuesday, SIR ARTHUR COLEFAX, K.C., in opening the case for the opposition said there was one issue, and one only, and that was whether boric acid was a fine chemical. His case was quite definitely that it was a fine chemical. The evidence on the other side was very weak, inasmuch as all the witnesses called were gentlemen whose dealings were practically negligible, so far as the home market was concerned, in boric acid, although they dealt more largely in borax. In spite of the evidence from Italy, he ventured to suggest that no attempt had been made to show the precise nature of the method of manufacture in Italy. The witness from Italy had been very glib as to getting 99·5 per cent. content of boric acid from some very pure waters, but nothing had been said as to the manner in which they purified the 55 per cent. stuff and got it to 99·5 per cent. content. The manufacture of boric acid as carried out in this country was an extremely difficult one, because the product had to be of extreme purity and as free as possible from lead and arsenic. In our case the arsenic occurred in the mineral from which the boric acid was made, and was not imported into the substance, as was the case in the Italian process, during the manufacture. It was the very high degree of purity which brought boric acid within the category of pharmaceutical chemicals in the opinion of many people. All the trade evidence on the other side really was to the effect that the witnesses had heard that boric acid was a heavy chemical by repute.

THE REFEREE asked if there was any import into this country other than the Italian.

SIR ARTHUR COLEFAX said the Italian import was about 40 per cent. of the whole, but there was no crude product from any other country except Italy. He thought it was a slip that the Board of Trade counter statement put it forward that 80 per cent. of the use was for medicinal and surgical purposes. He believed that that included also food preservation.

Evidence of Trade Witnesses

MR. ALFRED HOWARD, director of Howard and Son, said he had always considered boric acid a fine chemical. Ninety per cent. of the product of his firm went to wholesale druggists for pharmaceutical use, and the remaining 3 per cent. went to drysalters. It was all B.P. quality. His firm bought its raw materials from Borax Consolidated, Ltd., and it was usually boracite or colemanite.

In the course of the evidence, it was intimated that information as to methods of manufacture in this country would be heard in private.

The witness agreed that in his firm's catalogue there were some heavy chemicals, but they were the pharmaceutical quality of heavy chemicals.

THE REFEREE: Do you regard your boric acid as a fine chemical, even if it is not up to B.P. standard.

MR. HOWARD said he did, because it required such careful preparation. He had no opinion as to whether borax was a fine chemical. Commercial borax he would regard as heavy, but commercial boric acid he regarded as a fine chemical.

MR. HARRY POOLE, proprietor of G. H. Poole and Son, Bootle, also said he regarded boric acid as a fine chemical. Prior to 1920 the whole of his output was for food preserving purposes, and it was practically all up to B.P. standard. He supplied a small quantity for industrial purposes now. In cross-examination, the witness agreed he could not refer to any trade journal in which boric acid was referred to as a fine chemical.

Asked by the Referee whether he regarded borax as a fine chemical, the witness said he would like to regard it as such, but it did not require the same expert attention in production as boric acid.

THE REFEREE: If you were trying to be quite fair and independent about it, you would say that borax was a heavy chemical?

THE WITNESS: Yes.

MR. THOMAS E. LESCHER, director of Evans, Son, Lescher and Webb, wholesale druggists and manufacturing chemists,

said he supplied boric acid almost entirely for medicinal and preservative purposes, and 90 per cent. of what he bought was of B.P. quality. He did not make any boric acid, but purchased three kinds, viz., commercially pure, B.P., and chemically pure. The commercially pure was generally of B.P. quality, but it was not guaranteed.

THE REFEREE: Why do you regard it as a fine chemical?

The witness said that so far as he was concerned, it was mainly used for medicinal purposes and food preserving. It was an article which both dealers and manufacturers insisted upon having of the greatest purity, but he did not regard, necessarily, everything that was of B.P. standard as a fine chemical. If a chemical was used mainly for industrial purposes, then there would be no doubt in his mind that it ought to be regarded as a heavy chemical. Boric acid, however, was used mainly for pharmaceutical purposes.

THE REFEREE: That may be so because that is your part of the trade.

MR. BENJAMIN D. JONES (secretary of Burton, Baker and Co., food preservative makers) said that his firm used 300 tons of boric acid annually. He bought in England from Borax Consolidated, Ltd.

MR. FREDERICK DICKENS (London manager of Darton, Gibb and Co., antiseptic surgical dressing manufacturers) said that his firm used 50 tons of boric acid per annum.

MR. P. A. W. SELF, analytical chemist, handed in figures of analyses which he had made of commercial boric acid, which went to show that the quality was very good. On a rough basis, he regarded all chemicals coming up to the B.P. standard as fine chemicals, but not necessarily so. He regarded boric acid as a fine chemical because the commercial quality practically came up to the B.P. standard. The process of manufacture would also have to be taken into account.

MR. F. L. HOCKING (pharmacist to the London and other hospitals) said the London Hospital used about 2½ tons of boric acid per annum. There were 900 beds in the hospital, and about 120,000 out-patients per annum. He also bought from Borax Consolidated, Ltd., and from Howards.

The hearing was resumed and concluded on Wednesday, when further evidence was given by Mr. E. White (Hopkin and Williams, Ltd.), Mr. H. F. Johnson (Borax Consolidated, Ltd.), Mr. H. Dering (Joseph Townsend & Co., Ltd.), and Dr. H. Bassett (Professor of Chemistry at University College, Reading).

The Referee's decision will be given in due course.

Scientific Glassware Inquiry

A COMPLAINT that reagent bottles, hydrometer jars, museum jars, specimen jars, surgical jars, cylindrical measures (bell shaped) and conical measures have been improperly included in the list of dutiable articles issued by the Board of Trade was considered by Mr. Cyril Atkinson, K.C., on Monday. The Board of Trade was represented by Mr. Courtney Terrell, and the complainants, Jules Lang and Co., glass importers, were represented by Mr. Kenneth Swan. The case for the Board of Trade was taken first. Scientific glassware is included in the schedule to the Act, but the complainants case was that certain types of the articles complained of were not used for scientific or technical purposes, and therefore should not be classified as scientific glassware.

MR. JAMES H. GARDNER, technical manager to James Powell and Sons, Whitefriars Glassworks, said that his firm had two distinct branches, one for domestic glassware and the other for scientific glassware, and the articles mentioned in the complaint were dealt with by the scientific glassware branch. He regarded the reagent bottle as a laboratory tool rather than a bottle for putting things in. The characteristics of such bottles were that they must have a well ground stopper, and be made of the finest quality glass.

THE REFEREE said it seemed to him that the complaint in this case was really a matter to be dealt with under Section H, which provided for disputes with the Customs to go before another Referee, but he hoped as the result of his discussion, that some means would be found to assist the Customs.

MR. GARDINER, in the course of further evidence, said that another characteristic of scientific glassware generally was careful annealing, and as all these articles were used for scientific purposes by chemists and druggists, and in chemical laboratories, he could not conceive of them being other than scientific glassware. In the case of cylindrical measures, a great deal depended upon the accuracy of the measurement. Whether they looked at the matter from the point of view of the people who made the apparatus or those who used it, these things must be classified as scientific glassware.

MR. BAIRD, of Baird and Tatlock (London), Ltd., gave similar evidence. He said that before the war none of these things were made in this country, but at the request of the Government he formed a company known as Duroglass, Ltd., to take up certain lines. He had since sold that company. The great essentials in a reagent bottle were freedom from lead, accuracy of grinding of the stopper, and hardness of the glass to resist the corrosive action of reagents. This type of article could only be obtained from makers of scientific glassware.

THE REFEREE said he could not see how it could be said that cylindrical measures were improperly included, seeing that measuring cylinders were specifically included in the Schedule.

MR. SWAN, for the complainants, said the general case he was going to put forward was as to whether by scientific glassware was meant glassware made in a scientific and highly skilled manner, or glassware intended for use for scientific purposes. No one would call a bottle which a confectioner used scientific glassware, yet bottles and jars were used for this purpose which were very similar to some of the jars used as specimen jars. The same applied to reagent bottles. There were many bottles of a cheaper character coming into the country which were not actually being used as reagent bottles, but merely for storing liquids in, and the Customs were insisting on levying the duty upon them. His real objection was not to the inclusion of the reagent bottle made in a highly scientific manner for a scientific purpose, but to the duty being put upon a cheaper class of bottle which was also called a reagent bottle, but which was not, in fact, used as such. Continuing, Mr. Swan said he had been trying to devise a formula which might separate the two, and he suggested that the word "resistant" might help if it were added in the case of reagent bottles, although it would not help in the case of the other items.

MR. BAIRD said that he never sold reagent bottles for any other purpose than for holding reagents, and as long as it was a bottle of such a class that it could be used for holding reagents, then it was scientific glassware, in his opinion.

In the course of further discussion concerning jars, and measures, it was pointed out that plain cylindrical measures came into this country and were marked here, yet the Customs charged the duty.

MR. TERRELL, for the Board of Trade, said he agreed that until a measure was graduated, it could not be called a measure.

MR. SWAN suggested that perhaps the difficulty in that case might be got over by adding the word "graduated" to the list.

SIR HERBERT JACKSON, F.R.S., was then called on behalf of the Board of Trade, and said that in his view anything that had by tradition and use come to be known as scientific glassware, must continue to be classified as such. The whole aim now was to make the articles mentioned in the complaint of the highest possible class, and a list had been prepared for the purposes of a sub-committee dealing with scientific glassware, and it included all the articles in the complaint. It might be that bottles and jars were coming into the country which were not properly made, but that did not make them any the less scientific glassware. He regarded all apparatus made for use in laboratories as scientific glassware, and he relied upon tradition very largely to determine what was scientific glassware and what was not.

The Complainants' Case

MR. E. J. PARRY said he adopted the evidence of Sir Herbert Jackson to the extent that where this apparatus was used for the special purpose for which it was specified, then it should be in the list. The fact, however, was that there were many so-called reagent bottles of a cheaper kind which answered the purpose of containing liquids in the laboratory and were not used as reagent bottles in the proper meaning. He himself

used many such bottles, yet these bottles were being treated as reagent bottles by the Customs, and the duty was being levied. The same thing applied to specimen jars. Personally, he had always understood scientific glassware to be glassware used in scientific operations. Bottles similar to reagent bottles were used to contain perfumes, but it could not be said that they were used for a scientific purpose. He could not agree that a cylindrical measure was scientific glassware.

MR. BUSH, managing director of H. W. Bush and Co., Ltd., dealers in chemists' and druggists' sundries, said he sold bottles known as shop rounds, which were used by chemists for containing substances which were kept on the shelves of their shops,' but the Customs had levied the tax upon them as reagent bottles, and at the same time fined him £1 for misdeclaration. He also imported plain cylindrical measures, and graduated them here, and the tax had been levied upon them as cylindrical measures.

MR. FERDINAND LANG, proprietor of Jules Lang and Co., the complainants, gave similar evidence, and produced samples of the types of bottle and jar which he said are not used for scientific purposes, although they go by the same names, and which are charged with duty by the Customs. In the case of reagent bottles, they were invoiced as such, but in his case they went by that name simply on account of the shape of the stopper, and many of them were sent to druggists for ordinary purposes.

THE REFEREE said that the difficulty seemed to be to find some words to be added to the list which would restrict the duty to the high-class articles which were used for really scientific purposes, and intimated that his decision would be given later.

Glass Bottles Inquiry

MR. C. A. RUSSELL'S Committee, which has been appointed under Part II of the Safeguarding of Industries Act to consider the application to impose an import duty upon glass bottles imported from Germany and Holland, resumed its inquiry on Tuesday, when Mr. T. W. H. Inskip, K.C., M.P., opened his case for the opponents. Mr. Inskip, together with Major MacKenzie Wood, M.P., appeared for the Owners of Proprietary Articles Section, the Infants' and Invalids' Food Manufacturers' Section, and the Perfumery Manufacturers' Section of the London Chamber of Commerce; and certain trade associations.

At the outset, Mr. Inskip said that the basis of the case for the complainants was that the only thing which prevented the success of the industry was the difference between the internal and external value of the mark. Dutch export was said to be possible because the Dutch were importing and re-exporting German bottles, so that the complaint in regard to Holland was really on the same ground as that in respect of Germany. Mr. Alexander, in his evidence, had said that a trust had been formed in 1907 to protect the interests of the glass bottle trade, and also, that it was felt necessary to regulate the output for some time, because, with a machine such as the Owens machine, unless there were some regulation of output, the market might be swamped. From 1907, therefore, there was a deliberate attempt by the British combine to limit output, in order to enable them to maintain the prices which would show a profit, and presumably the combine sought, so far as their powers enabled them to do so, to control the market. The reasons for the present unemployment in the industry were bad trade and the extent to which the Owens machine was used.

MR. J. R. C. JORGENSEN (director of Johnson and Jorgensen, Ltd., glassware merchants, London), giving evidence, briefly went over the history of the industry in this country, in order to show the excellent opportunities afforded the manufacturers during and after the war. As to labour, the most modern types of automatic machinery and labour-saving devices had been installed, and yet, in comparing complainants' figures, it would be found that the cost of labour was in many cases over twice the pre-war figure. If a duty of 33⅓ per cent. were imposed on all bottles from Germany and Holland, this would not prevent the importation of certain types of bottles which were not efficiently manufactured in this country, and which could not be supplied except by skilled hand labour. He referred, amongst others, to turned bottles and bottles for the perfumery trade, both stoppered and unstoppered.

The Committee adjourned until Tuesday, June 20.

Final Decision on Gas Mantles

THE final decision of Mr. Cyril Atkinson, K.C., the Referee under Part I of the Safeguarding of Industries Act, in regard to the complaint that gas mantles were improperly excluded from the list of dutiable articles issued by the Board of Trade —following the judgment by the Divisional Court upon points of law raised by the British gas mantle manufacturers—is in the following terms:—

"I am quite satisfied that it is my duty to give effect to the view I had formed when I was asked to state a case—viz., that a mechanical aggregate of two dutiable substances was itself liable to duty. The complaint was that gas mantles were improperly excluded from the list, and in the statement of their case the complainants asked only that gas mantles should be included. But quite early in the hearing it was clear that the question whether mechanical aggregates of dutiable substances were themselves dutiable was the first question to be determined. The complainants said they were, and on that contention based their demand for the inclusion of mantles. It was quite clear that a possible result was the inclusion of the mechanical aggregate as an ingredient of a gas mantle, even though the mantle itself could not be included. The question was in terms raised in the counter-statement of the Board of Trade.

"Evidence was called by the Board of Trade to the effect that the invariable practice of the Customs authorities was to charge a duty on the value of the dutiable ingredient. Mr. Hunter Gray, K.C. (for the National Gas Council), agreed that, to the extent that there was thorium oxide and cerium oxide in the mantle, these two bodies were covered by the words 'compounds of thorium and cerium.' He took the point that that was not before me, but later, both he and Mr. Whitehead (for the Board of Trade) said that although the complaint was limited strictly to one issue, if I desired to go outside it, and it was within the terms of my appointment, they made no objection on the question of form. Finally, Mr. Whitehead expressly invited me, as a question of construction, to say that the Schedule did not cover mixtures of the several compounds mentioned.

"It seems to me quite impossible to say that the question whether mechanical aggregates of the oxides or of the nitrates of thorium and cerium was not properly before me. I am inclined to think that it was expressly covered by the complaint that gas mantles were wrongly excluded from the list. If a gas mantle is liable to duty, even in respect of an ingredient, I think the total exclusion is wrong. If the point was not covered by the notice of objection, the complainants had only to give another notice; the three months had not expired, and if the Board of Trade and Mr. Hunter Gray had persisted in their objection, and not taken the course they in fact took, I am satisfied that the requisite notice would have been given.

"I therefore decide that the phrase 'Compounds of thorium, cerium, etc.,' includes mechanical aggregates of oxides of thorium and cerium, and of nitrates of thorium and cerium, and I award that the list be amended by including therein 'Mechanical aggregates of oxide of thorium and oxide of cerium and of nitrate of thorium and nitrate of cerium, being ingredients of incandescent gas mantles.' I also award that the complainants pay the costs of the Board of Trade and of the National Gas Council of the special case, but not including any costs of any hearing before me.

Society of Public Analysts

THE next meeting of the Society of Public Analysts will be held on Wednesday, June 7, at the Chemical Society s Rooms, Burlington House, Piccadilly, London, at 8 p.m., when the following papers will be read:—"The Action of Natural Waters on Lead," by John C. Thresh, M.D., D.Sc., F.I.C.; "The Estimation of Meconic Acid in Opium," by H. E. Annett, D.Sc., F.I.C., and M. N. Bose, M.A.; "The Composition of Cows' Milk in the Sudan," by A. F. Joseph, D.Sc., F.I.C., and F. J. Martin, M.A., A.I.C.; and "The Use of the Daylight Lamp in Volumetric and Colorimetric Analysis," by W. Singleton. Arrangements have been made for members and their friends to dine together before the meeting at St. James's Restaurant, 178, Piccadilly (opposite Burlington House), at 6.30 p.m.

The Structure of Coke

Discussion on Sir G. Beilby's Lecture

AT a meeting of the London Section of the Society of Chemical Industry on Monday, May 29, at which Mr. E. V. Evans presided, Sir George Beilby presented a paper on "The Structure of Coke." It consisted of a repetition of much that is contained in the second section of the report of the Fuel Research Board for the years 1920-1921, in which a long account is given of low temperature carbonisation. He concentrated attention upon the structure of coke and showed on the screen illustrations of the assay coke obtained at the Fuel Research Board's experimental station. In this way he showed the result of blending coals of widely differing fusibility. Additional information was given of later work and attention was drawn to the work of Messrs. Evans and Sutcliffe and to the remarkably homogeneous structure which they have obtained by their process. The feature of recent work is the bubble formation which gives such a homogeneous structure, and which is likely to have important results in regard to low temperature carbonisation in the future.

South Metropolitan Experiments

The CHAIRMAN, who explained that he had been asked to say something about the material that his company had been working upon, said that his company came to the conclusion, after taking advantage of the work of Sir George Beilby, Mr. E. C. Evans, and others upon the subject, that if they could admix the ground coke with some fusible coal, or coal which under distillation conditions would give a compact mass, they had ample waste heat for the purpose in their retort settings. The experiments were exceedingly successful because they had stumbled up against the fact which Messrs. Evans and Sutcliffe demonstrated a few months ago, that this finely ground material combusted in an exceedingly active way and his company manufactured an excellent fuel. The general financial conditions of its manufacture were good, but there was one big difficulty, and that was that the coal which gasified and coked well usually had a high ash content, and it became an expensive matter to put down the necessary washing plant to get rid of it. He believed they would be able to do it, but at present this fuel, which was ground and which combusted so readily, did not look quite so nice as it should, although the ash was a better one and did not float about the room like the ordinary ash. They had therefore come to the conclusion that they must get the washing plant into operation before this fuel could finally be put upon the market.

Dr. Lessing

Dr. R. LESSING said that this work of Sir George Beilby opened up an entirely new vista and no doubt many of them who had been dabbling in this complex problem of carbonisation would now turn their minds in the direction indicated by him. Not only was the paper of a fundamental character, but it demonstrated the extremely high manipulative skill which Sir George had brought to bear on the subject, for which many of them envied him because they simply could not follow on these lines. Referring to one small point arising out of a paper which he himself had read ten years ago, he was extremely gratified to find in the paper by Sir George Beilby an explanation of a phenomenon which at that time he could not possibly explain. On that occasion he had shown some coke specimens from one particular coal which in every instance turned out with a certain irridescence on the surface. The specimens of carbonised sugar which Sir George had shown gave the explanation. During the discussion on his own paper, he was asked by one gentleman whether it was due to the presence of aniline dyes in the coke or coal (laughter), but they now knew that it was akin to the colouring of soap bubbles, simply due to the extreme thinness of this coke foam. There was one point bearing on the subject of coal carbonisation which had not been attended to sufficiently, and the paper that evening would probably lead the way to a better consideration of it. Sir George had told them that the carbonisation of minute particles of coal could be considered as comparatively uniform reactions. On the other hand, if they took even small quantities such as 20 grammes in the assay apparatus, or even one gramme, according to his observations, uniform reactions did not go on any longer. The walls and the centre of the material showed entirely different structures. Again, if they took a coke oven charge of, say, 10 tons at a temperature of, say, 1,200° C., at the walls, it would be found that the outside skin of that coal only got carbonised where it was in contact with the oven wall. There they got high temperature carbonisation *par excellence*, but it must be remembered that the crude gas and tar vapours of a pitchy nature found their way towards the centre of the charge—and the same applied to the gas retort—and eventually gave an inner core which showed what Sir George Beilby had called the bubble structure of coke. This was, in effect, the condensation of the primary products of carbonisation from another part of the oven, producing in the centre a mixture of coal and these primary products which was in no way similar to the original coal. That was a point which fitted in very well with the theory that had been propounded by Sir George Beilby and also demonstrated the extreme difficulty of dealing with carbonisation problems, inasmuch as they never had a chance to consider the problem from the point of view of the original raw material, but had to deal with one which was progressively altered throughout the whole coking process.

Mr. E. C. Evans

Mr. E. C. EVANS said he would like to add his appreciation and that of his colleagues of the brilliant lecture they had heard. The importance of the work was that Sir George Beilby had resolved for the first time not so much the cells in the various cokes, as the walls of the cells. The structure of these walls was of importance and it played a tremendous part not only in carbonisation but in chemical reactions of quite another order. He believed this question of structure was going to be of vital importance in the future, not only in connexion with coal carbonisation but in practically all chemical reactions in which solids played a part, and if we could only get the initial structure which would allow these chemical reactions to take place more freely and more easily, he believed we should be able to solve commercially a number of the problems which were facing industry to-day.

A hearty vote of thanks was accorded to Sir George Beilby on the motion of Sir Frederick Nathan.

Death of M. Ernest Solvay

WE regret to announce the death, which occurred at Brussels, on May 26, at the age of 85, of M. Ernest Solvay, the well-known Belgian chemist. Ernest Solvay and his brother Alfred were originally gas engineers, and in their early days devoted their attention to the ammonia-soda process, in which they made considerable improvements, which culminated in the now familiar Solvay process. The patents of this process were ultimately sold to Dr. Ludwig Mond, who joined Mr. John Brunner, as he then was, and founded the great business of Brunner, Mond and Co., Ltd. The brothers Solvay worked together until the death, some years ago, of Alfred, and their interests lay not only in Belgium, but in France, the United States of America, Spain and other countries, where large and flourishing works have been founded.

M. Ernest Solvay did a great deal to encourage both pure and industrial chemistry. He organised a number of important conferences in Brussels, and rendered considerable assistance in the formation of the International Congress of Chemists. Characterised by his friends as a genial and considerate man, he enjoyed remarkably good health up to the time of his death, and even so recently as two years ago was an enthusiastic mountaineer. A considerable part of the large fortune which he had accumulated was devoted to social work of various kinds, and he founded at Brussels the institution which bears his name. King Albert, who esteemed him highly, nominated him Minister of State shortly after the Armistice in acknowledgment of the important public services rendered by him during the war. At M. Solvay's expressed desire the funeral ceremony was strictly private.

Sulphur in Coke

MR. A. R. POWELL, physical organic chemist of the U.S.A. Bureau of Mines, in the course of a physico-chemical study of sulphur in coke, has found that ferrous sulphide decomposes in coke when cooled, the iron being soluble in HCl. An isotherm indicated that sulphur remained in the coke in the absorbed form. After acid extraction and heating in a tube some sulphur was distilled and collected on the cold ends.

Meetings of Nitrate Companies

Barrenechea Nitrate Co.

In the course of his speech at the eighteenth annual meeting of the Barrenechea Nitrate Co., Ltd., the Chairman (Mr. R. E. Morris) said it had not been possible to resume manufacturing operations, nor could he give any definite date for the re-opening of the company's oficina. In fact, it might suit them better—in view of the nature and extent of their ground—to sell their quota for the next year or two, if a suitable price could be obtained, and thus preserve their caliche until more remunerative prices prevailed. Their maquina was in first-class condition, and when the present grounds were exhausted would prove an important asset in the event of any new property being acquired. In these circumstances the directors did not feel justified in recommending the distribution of a larger dividend than 35 per cent., less income tax.

In spite of the many unfavourable factors the accumulated stocks of nitrate of soda might, he thought, have been disposed of as the supplies of sulphate of ammonia were smaller than expected if the weather conditions had been more normal. Even now there might, and probably would be, large sales for June and perhaps July delivery, but there would undoubtedly be left over an appreciable quantity which might perhaps to-day be estimated at 200,000 tons. As this, however, would practically represent the total European visible supply, it might be considered small.

The trouble so far as producers were concerned, continued Mr. Morris, was the stocks in Chile, which at the end of next month would probably amount to 1,500,000 tons. It was evident that this must be greatly reduced and, consequently, the output of nitrate for the next twelve or eighteen months must be materially curtailed. However, although the stocks were so large, he believed that they might be absorbed more quickly than people thought, because it was generally admitted by all in the fertiliser trade that there was in other competing commodities a considerable shortage of supplies, with an ever-growing demand. Cultivators of lands the world over were better educated than in past times, and a large percentage keenly realised the importance and necessity of a more scientific treatment of their ground.

According to the Statutes, the prices for the year commencing July 1 next had to be settled in May or June of this year, and at the close of March last the Chilean Nitrate Committee sent a very comprehensive cablegram to Valparaiso setting out the general position and recommending that prices for the next nitrate year be fixed as early as possible. It pointed out that the current prices were in no way checking consumption in any country excepting Germany, and that it was impossible to take that country as a guide in fixing the prices because, owing to artificial circumstances, it had been kept for some years on a level below the lowest price at which nitrate could be placed in Europe.

The Committee suggested that an average price of 10s. 6d. to 11s. 6d. per quintal would be reasonable and not diminish the selling power, but in deference to contrary opinions which were known to exist in Chile, it recommended 9s. 6d. to 10s. 6d. per quintal. The directorate replied that the prevailing opinion on their side was decidedly contrary to so high a figure, and suggested an average of about 8s. per quintal. In his opinion, the views of the committee here were correct, and he thought that the Valparaiso directorate were ill advised in putting the price so low. Personally, he believed that when an appreciable part of the present large stocks had been liquidated it would be found expedient by the very people who had advocated low prices to increase the selling figure.

San Sebastian Nitrate Co.

Presiding at the annual meeting of the San Sebastian Nitrate Co., Ltd., held at Winchester House, London, on May 25, Mr. H. W. Sillem said it was a disappointment to the Board not to be able to recommend the payment of a dividend, but they felt that, in view of the position of the nitrate industry, prudence in financial matters was still essential, and that a conservative policy adopted now would prove ultimately to be in the best interests of shareholders. Before the normal position could be reached in the industry, he declared, stocks must be reduced. With the object of achieving this, the Nitrate Producers' Association, at a meeting held in Valparaiso on May 11, decided upon a scale of minimum prices to commence next July which they expected would stimulate demand. Like almost every other industry in the world that of nitrate was just now passing through a difficult phase, but the directors were convinced that it was only a question of time for the trade to reach a thoroughly sound and healthy condition.

Tarapaca and Tocopilla Nitrate Co.

Speaking at the annual meeting of the Tarapaca and Tocopilla Nitrate Co., Ltd., held at Winchester House, London, on Tuesday, Sir Robert Harvey said that since the last meeting no work of any kind had been carried on by the Oficinas of the company with the exception of delivering and liquidating the balance of the contracts allocated to them by the association in the year 1920, but not shipped or taken into account in that year. These contracts, together with the proceeds of their iodine sales during the year, realised a net trading profit of £57,343 12s. 4d. Dealing with an item in the accounts of £5,570 19s. 4d., contribution to German producers, the chairman said this sum was the company's proportion of an allowance which the Nitrate Producers' Association granted on behalf of all its members to the German producers as an inducement for them to join the Association. Their argument was that by entering the Association they were foregoing certain considerable advantages which they were enjoying as long as they remained independent, whilst the directorate of the Association strongly held the view that it was imperative, in the interests of the industry, that they should come in. It was only after very protracted negotiations that a *modus vivendi* was found, under which they joined the Association. As a result the latter now embraced the whole of the nitrate producers, with the exception of the small percentage of the American producers, who were, by what was called the "Sherman Law," prevented from joining such an Association.

Mr. T. Tertius Aikman and the company's secretary, Mr. Huni, had recently paid visits to the coast and carefully examined all the company's properties. Their reports on their future prospects—under more or less normal conditions—were undoubtedly favourable and encouraging, and, given the needed extensions of plant, etc., the company showed every sign and hope of having a long and prosperous life.

Institute of Physics

At the annual general meeting held on May 23 in the rooms of the Royal Society the following officers and Board were elected to serve for the year beginning October 1, 1922:—*President*: Sir J. J. Thomson, O.M. *Past-President*: Sir R. T. Glazebrook, K.C.B. *Vice-Presidents*: Sir Charles Parsons, K.C.B., Prof. W. Eccles, Prof. C. H. Lees, Mr. C. C. Paterson. *Non-Official Members of the Board*: Dr. R. S. Clay, Prof. C. L. Fortescue, Prof. A. Gray, Major E. O. Henrici, Sir J. E. Petavel, K.B.E., Dr. E. H. Rayner, Sir Napier Shaw, K.B.E., Mr. R. S. Whipple. *Representatives of Participating Societies*: Physical Society—Mr. C. E. S. Phillips, Mr. F. E. Smith; Faraday Society—Mr. W. R. Cooper; Optical Society—Mr. John Guild; Rontgen Society—Dr. C. W. C. Kaye; Royal Microscopical Society—Mr. J. E. Barnard.

The annual report stated that there were 408 members of the Institute at the end of the year, of whom 258 were Fellows. The Institute is watching the possibility of establishing a Central Library for Physics, although the financial difficulties in the way of its realisation are stated to be considerable.

In the course of his presidential address Sir J. J. Thomson, after dealing with the project to establish a "Journal of Scientific Instruments," spoke of the present depression in industry, but he made the reassuring statement that out of 67 students who graduated with distinction in physics and chemistry in 1921, 46 had obtained suitable positions while 14 were doing research work. He hoped that the series of lectures on physics in industry which had been established would act to some extent as "Refresher Courses."

Speaking of the difficulties which the Safeguarding of Industries Act had, in many instances, placed in the way of research, he characterised research itself as a "Key Industry," and he hoped that the Government would put every facility in the way of research workers being able to obtain without delay the apparatus they required.

Opening Up Europe

By Sir Ernest J. P. Benn

THE illimitable possibilities of Europe as a market are at long last beginning to attract the serious attention of commercial men. The continent of Europe, the centre of civilisation, with 1,000,000,000 human souls, has, from a trade point of view, for nearly eight years been dormant. This vast aggregation of modern peoples has since 1914 been engaged in war and war's aftermath; every man, woman, and child among them being obsessed with the idea that as a result of their war-like efforts they were going to secure, in some undefined way, a higher standard of living and comfort. The "homes for heroes" which cheered us up in the dark days of 1916 and 1917 were reproduced in the mind of every inhabitant of this vast continent, and now, the time has arrived when people's patience is exhausted and they will insist upon having some of these things. From a business point of view there never were such opportunities and openings as now present themselves in Europe. The people have learnt that Peace Treaties and Supreme Councils cannot provide food and houses and clothing and all the little luxuries on which they have set their hearts; the eyes of the world are coming round to the business man, and the business man will undoubtedly show himself worthy of the opportunities that now confront him. Mr. Lloyd George on his return from Genoa told us that all the peoples were yearning to get back to business, and that they looked to England to give them a lead.

Apart from these general considerations, a study of the problems in detail and an examination of the situation in each of the thirty sovereign States which now compose the Continent of Europe lead to the same conclusion. Everywhere one finds potential trade openings of unprecedented magnitude, and everywhere one also finds that the eyes of the populace are turned towards England in this connexion. Take as an example the new State of Poland, a vast area almost as large as the United Kingdom. Less than four years ago the new Poland was partly German, partly Russian, and partly Austrian, and it is now a mighty new nation anxious to build up a great commerce of its own. This new sense of independence which fills its blood makes it turn to new quarters in commercial matters, and seek in England and in France for trade, connexions. By transferring their trading interests in this way they help to establish their new independence on a more solid and a firmer basis than a mere Treaty of Peace.

Similar considerations and similar circumstances are found wherever one turns. Hungary, until recently part of the old Austrian Empire, now a self-contained and proud State, with a surplus of foodstuffs and a need of manufactured goods; if Hungary resumes its old trading habits and goes back to Austria or Czecho-Slovakia for its supplies, its new independence will be merely political, whereas Hungary is as anxious as every one of these new States to acquire not only a political, but an economic foundation of its own. Thus we find the merchants of Budapest giving English titles to their banks and filling their warehouses with English goods, so far as these are available to them.

Everything is new in Europe, including the bulk of the trading classes. The greatest of all the many revolutions which have occurred in the last few years is the money revolution. The catastrophic alterations in the values of currency have for the most part had the effect of wiping out the propertied classes of a few years ago. The wealth of to-day belongs to new men, the merchants and the buyers of to-day are the *nouveaux riches*. Human nature is the same the world over and these people are not willing to take up the threads of commerce and finance as left by their predecessors. They look upon themselves as representatives of the new emancipation, and do not want to follow the traditions of the past. These and many similar considerations account for the extraordinary warmth of the welcome which awaits any English business man who will journey into Central and Eastern Europe to-day.

The average Englishman knows something of Paris and Brussels, he is vaguely aware of the location of Berlin, and if he is a young man he is closely and painfully acquainted with the geology of Flanders, but apart from that our ignorance of Europe as a whole is little short of appalling. Most people are surprised when they are told that Warsaw is a town which rivals Manchester in importance, and astonished when they find its fine, broad streets swarming with hundreds of thousands of clerks and messengers, and its postal, and transport, and telegraph services buzzing and humming with an activity which is only equalled by our own. Yet Warsaw is one of thirty towns within a couple of days' journey of London, all of equal commercial importance. Very few people know that there is a daily train which runs from Ostend to Constantinople, or that you can get into a train de luxe at Riga and run straight through to Madrid any day of the week that suits you. There is hardly a corner of Europe which is not to-day oozing with business opportunities; all along the thousands of miles of Soviet Russian frontier are squatted eager traders, profiteers, if you like, engaged in illicit business with the unfortunate Russians, and this commerce has assumed such vast importance that a big international exhibition is to be held this year at Reval.

The Americans have, as might be expected, not been slow to realise these possibilities, and Europe is to-day literally swarming with visitors from the United States. The farther East one goes, the more one seems to meet these enterprising people. Constantinople is full of them, and every town on the way has its quota.

There are difficulties, of course there are difficulties, grave difficulties, but the chief difficulty is surely that the manufacturer and trader of our generation has been so spoilt, so spoon-fed, so cared for, and looked after, that he cannot work up the energy to attempt any business except that which is positively smooth, easy, and certain. If our forefathers who invented the arts of business, and taught the world what trade means, were here to-day they would smile at the trifling inconveniences which are sufficient to restrain the modern manufacturer from going after business in Europe. There is first of all the question of currency. It is far too commonly supposed that a fluctuating currency or a depreciated currency is a bar to business. It is an inconvenient circumstance, but nothing more. The risks of fluctuation can be covered by the purchase of currency at any moment in any market. The way in which the peoples of Europe have accommodated themselves to the instability of currency conditions is one of the marvels of the age. If the people of Austria can still live in comfort with a money which has depreciated to a ten-thousandth part of its former value, surely, the British merchant is not incapable of accommodating himself to similar conditions. All these difficulties do not really count when measured by the opportunities which exist. If the English trader still insists on having his business made fool-proof before he will proceed, then others will supply the needs of Europe; but if that fine commercial spirit which was at one time England's pride would to-day arouse itself, both England and Europe might be very much better off in the next few years.

These are the considerations which have led Benn Brothers, Ltd., to take the bold step of establishing a commercial weekly paper in the very centre of Europe. *The European Commercial*, which will make its appearance from Vienna in the first week in September, will have a dual mission. On the one hand, it will set itself to inform the merchants of England and America of the actual conditions in the various states of Europe. On the other hand, it will be acclaimed throughout commercial circles in Europe as a link between them and England and will enable them to do the thing which to-day they most desire, to get into touch with English merchants, manufacturers, and financial houses, and open up business negotiations. *The European Commercial* comes upon the scene at the moment when Europe is ripe for a commercial revival, the business men of all countries now realise that they must get together and get busy if civilisation is to be saved, and *The European Commercial* is the first big, important step in that direction.

Dr. Moore's Visit to Europe

DR. R. B. MOORE, Chief Chemist of the U.S.A. Bureau of Mines, sailed on May 6 for England, preparatory to spending two months in various European countries for the purpose of obtaining data desired in various problems in the work of the Bureau along chemical and mineral technology lines. Dr. Moore will also represent the Chemical Warfare Service and other Federal bureaux engaged in chemical research. Dr. Moore will spend some time in England, Germany, France, Austria, Czecho-slovakia, Holland, and Belgium.

Chemical Matters in Parliament

German Drugs

Dr. Murray (House of Commons, May 24) asked the Minister of Health whether he was aware that at the Hospital for Tropical Diseases in London a drug known as Bayer 205 was largely used; and whether he could state whether this drug when imported was considered a fine chemical and subject to a duty of 33⅓ per cent. under the Safeguarding of Industries Act.

Sir A. Mond said he understood that this drug had been used in six cases in the institution in question. He had no information as to its precise chemical composition, but unless it was identical with any commodity specified in the list issued by the Board of Trade, under Section 1 (5) of the Safeguarding of Industries Act, or contained any commodity so specified which had not lost its identity, it was not at present subject to duty.

Cellulose Holdings Co.

Sir R. Horne (House of Commons, May 25) informed Mr. Wise that an agreement had been made under which the Cellulose Holdings and Investment Co., Ltd., had an option to purchase the power station of the British Cellulose and Chemical Manufacturing Co., Ltd., at a price of £200,000, and it was likely that the option would be exercised. In reply to a further question, Sir Robert Horne said the Government had no nominee on the board of the Cellulose Holdings and Investment Co., in which company the Government had no financial interest. The relationship between the Cellulose Holdings and Investment Co. and the British Cellulose Co. was that the former were purchasing £500,000 first mortgage debenture stock from the Cellulose Co.

Part II Orders

Replying to questions relating to the Government's policy in regard to the making of Orders under Part II of the Safeguarding of Industries Act, Mr. Chamberlain (House of Commons, May 25) said he hoped it would be possible to make an announcement before the Whitsuntide recess.

Colouring of Poisons

Answering Mr. Bowerman (House of Commons, May 25), Mr. Shortt said his attention had been drawn to a suggestion that poisons should be of a definite colour. Inquiries were being made as to the practicability of employing definite and distinctive colours for poisons, and if a favourable report was received the possibility of making new Regulations under the Poisons and Pharmacy Acts would be considered.

Difficulty of Obtaining Dyes

Replying to Mr. T. Thomson (House of Commons, May 29), Mr. Baldwin said he had read the speech made by the Chairman at the annual meeting of the British Cotton and Wool Dyers' Association, and the perusal of it as a whole did not suggest that there was any need for the appointment of a Committee to investigate the administration of the Dyestuffs (Import Regulation) Act. If there was any strong desire for such investigation, he would certainly have heard of it from the trade. He had not been pressed on the subject at all.

Reparation Dyes

Mr. Baldwin (House of Commons, May 29) informed Major Mackenzie Wood that the quantity of reparation dyes handed over by the Board of Trade to the Central Importing Agency during the financial year 1921-22 was 686 tons, valued at 33,300,000 paper marks. The amount realised during the year 1921-22 from sales was £293,323, and the commission paid to the Central Importing Agency on those sales and in respect of services rendered in connexion with dyestuffs allocated to the Dominions was £18,020. A charge was made by the Agency, on sales which they made, of 1 per cent., which was accounted for to the Board of Trade. Even if the reparation dyestuffs were sold by tender, some organisation would be required to carry out the services at present carried out by the Agency.

Laboratory Vacuum Flasks

Answering Mr. C. White (House of Commons, May 29), Mr. Baldwin said that laboratory vacuum flasks were included in the list of articles dutiable under the Safeguarding of Industries Act, because they fell within the scope of the general heading, "scientific glassware," in the Schedule to the Act. Ordinary vacuum flask food containers could not properly be regarded as included in this or in any other general heading of the Schedule, which was the only question which the Board of Trade had to determine.

Referee's Remuneration

Mr. Baldwin informed Mr. C. White (House of Commons, May 29) that he was not in a position to make a definite statement regarding the total amount of fees payable to the Referee under the Safeguarding of Industries Act, but the total fees payable to the Referee under Sect. 1 (5) of the Act up to March 31 last would not exceed 700 guineas.

Glass Bottles Inquiry

Mr. Baldwin, in reply to Mr. G. Thorne (House of Commons, May 29), said the complainants in the glass bottles inquiry had specifically limited their complaint to "all containers of five inches or less in internal diameter of the opening of the mouth." The inquiry was also limited to empty bottles.

Imports of Acetic Acid

In reply to Mr. G. Thorne (House of Commons, May 29), Mr. Baldwin said the particulars required to be furnished with respect to acetic acid imported during the six months ended March 31 last did not necessarily distinguish between the various grades of that commodity, and he was consequently unable to state what proportion of the £42,353 worth imported during this period represented grades which had since been deleted from the list of dutiable commodities.

Duplication of Appeals

Mr. Kiley (House of Commons, May 29) asked the President of the Board of Trade if he could arrange in reference to the appeals before the Referee under the Safeguarding Act that the Referee's decisions should be accepted as decisions in principle, and thus avoid the duplication of appeals.

Mr. Baldwin said that where it was perfectly clear that the learned Referee had laid down, as the basis of any decision, general principles by which he would goverh himself in the consideration of pending complaints, such principles had been and would continue to be carefully considered, with a view to obviating hearings so far as possible.

British Dyestuffs Corporation

Mr. Ormsby-Gore (House of Commons, May 29) asked the President of the Board of Trade why Dr. Levinstein had resigned from the management of the British Dyestuffs Corporation; whether dissatisfaction had been expressed regarding the composition of the directorate of the concern; and, seeing the large sum of the taxpayers' money that was invested in this concern, he would appoint a Select Committee of the House of Commons to investigate the conduct of the concern in order that a report thereon might be made to Parliament.

Mr. Baldwin said he was not at present aware of the precise causes of the resignation to which the question related, but that matter and any criticisms of the directorate were primarily questions for the consideration of the shareholders in the Corporation, in which the Government interest was only a subordinate one. He was not prepared to take the course suggested in the last part of the question.

Replying to Rear-Admiral Adair (House of Commons, May 31), Mr. Baldwin said the Government directors of the British Dyestuffs Corporation were Lord Ashfield and Sir Henry Birchenough, both of whom had much experience in the direction of large commercial and industrial undertakings. He did not regard detailed technical knowledge as necessary in the case of Government directors, and he understood that they were in full agreement with the policy of the board of the Corporation. He had seen certain Press statements attributed to Dr. Levinstein, but he did not know how far they correctly represented his views.

Replying to a question by Captain W. Benn regarding the position of Dr. Levinstein, Mr. Baldwin said that in business, as in politics, when a man ceased to co-operate with his colleagues, he was very apt to say that they could not get on without him. In answer to Mr. Mackenzie Wood, Mr. Baldwin said he had had no report from the directors as to the reasons for the resignation of Dr. Levinstein, but he had had conversations.

From Week to Week

EDIBLE NUT OILS, LTD., have transferred their registered offices to 125, High Holborn, London.

Receiving visitors at Port Sunlight last week, MR. W. HULME LEVER said that Lord Leverhulme had gone to America "to learn how to do things quickly."

Mr. E. V. JONES, F.I.C., has been recommended for the appointment of County Analyst for Staffordshire in succession to the late Mr. E. W. T. Jones.

Applications are invited by June 7, for the post of ASSISTANT LECTURER IN PHYSICS at the University College of North Wales, Bangor. Particulars may be obtained from Mr. W. P. Wheldon, Secretary and Registrar of the College.

Mr. S. N. Brown, of the BROUGHTON ANALYTICAL LABORATORIES, consulting and analytical chemists, announces that their offices have been moved from 29, Cannon Street, to Salisbury Chambers, Chapel Walks, Cross Street, Manchester.

According to an Agencia Americana message from Santiago, it is understood that the Government, with a view to PROTECTING THE NITRATE INDUSTRY from foreign competition, is considering a further reduction of the export duties on this product.

A demonstration of the efficiency of the FIREFOAM SYSTEM of extinguishing accidental oil fires was given at Wandsworth, London, on May 24. A 250 gallon tank of burning crude oil was, it is reported, extinguished in 10 seconds by means of Firefoam.

Reference was made at a recent meeting of the Barnet Rural Council to alleged objectionable smells emanating from the ELSTREE CHEMICAL WORKS. Part of the nuisance was said to be due to the method of removing material from the digester.

MR. S. BARRATT has been appointed assistant lecturer and demonstrator in chemistry at Leeds University. He was joint author with Professor T. R. Merton of a paper on "The Secondary Spectrum of Hydrogen," which formed the Bakerian Lecture of the Royal Society in March last.

The annual convention of the NATIONAL LIME ASSOCIATION, of 918, G. Street, Washington, D.C., will be held from June 14–16, at the Hotel Statler, Cleveland, Ohio. An interesting programme has been arranged and papers dealing with the technology of the uses of lime and the industrial problems of manufacturing and marketing lime, will be read.

MR. W. WATERS BUTLER, chairman of Mitchells & Butler, Ltd. (himself a practical brewing chemist) has, by a gift of £50, endowed an annual prize in chemistry at the Birmingham Municipal Technical School. This is to be known as the "William Russell" prize. Mr. Russell, for many years a chemistry master, recently retired from service.

Addressing the annual general meeting of the Institute of Physics, Sir J. J. Thomson spoke of the difficulties which the SAFEGUARDING OF INDUSTRIES ACT had, in many instances, placed in the way of research, and characterised research itself as a key industry. He hoped that the Government would put every facility in the way of research workers being able to obtain without delay the apparatus they required.

At a meeting of the Senate of London University on May 24, the degree of D.Sc. in Chemistry was conferred upon MR. G. A. R. KON, an internal student of the Royal College of Science. The thanks of the Senate were conveyed to the Committee of the Ramsay Memorial Fund for a gift of £200 for the institution of an annual gold medal at University College in commemoration of the late Professor Sir William Ramsay.

Further trouble has arisen in connexion with the recent STRIKE OF CHEMICAL WORKERS in South Wales. One of the terms of settlement, it is stated, was that the employers were to dispense with the services of the temporary workmen engaged during the dispute. It is alleged that a Swansea firm, however, has failed to fulfil this condition, and the tinplaters in the Swansea district have notified the employers of their decision not to handle any more acids produced by the firm in question.

The following papers were to be read at a meeting of the CHEMICAL SOCIETY, at Burlington House, Piccadilly, London, on Thursday:—"The reactivity of doubly-conjugated unsaturated ketones. Part III. Unsymmetrical hydroxy- and methoxy-derivatives," by J. S. Buck and I. M. Heilbron; "Phenopyryllium salts of distyryl ketones. Part I.," by J. S. Buck and I. M. Heilbron; and "Ring-chain Tautomerism Part II. The effect of the gem. diethyl group on the carbon tetrahedral angle," by S. S. Deshapande and J. F. Thorpe.

Speaking at the annual meeting, last week, of the Ivanhoe Gold Corporation, Mr. F. A. Govett said that during the year they joined with a group of companies in purchasing a block of shares in the Chemical and Metallurgical Corporation, which were more or less forced to sale at a price which he thought might easily be quadrupled or even more. This company owned the Elmore process for the separation of various classes of metals, starting with lead, zinc, and silver; the board were most sanguine as to the future of the company.

MR. C. E. STROMEYER, chief engineer to the Manchester Steam Users' Association, lectured before the South Wales Institute of Engineers at Cardiff, on May 25, on the FATIGUE OF METALS. After detailing extensive experiments he had conducted with a view to determining the fatigue limits of metals, Mr. Stromeyer said that America was going ahead rapidly with similar investigations, and that though he did not expect to see great results in this country in his lifetime he hoped for an improvement in engineering study in this regard.

SIR MILTON S. SHARP, chairman of the Bradford Dyers' Association, Ltd., on May 27, opened the Association's war memorial, which consists of a Convalescent Home, at Silverdale, Morecambe Bay. Facing the entrance door are eight bronze tablets bearing the names of the fallen, and over them is the inscription "Instituted to perpetuate the memory of the 707 employees of the Bradford Dyers' Association, Ltd., who fell in the Great War, 1914-1918, and of the 37 men who lost their lives in the disaster at the works of the Low Moor Munitions Co., Ltd., 1916."

In the Chancery Division, last week, before Mr. Justice Eve, Mr. Johnstone moved on behalf of Wood Brothers' Glass Co., of Barnsley, for an injunction to restrain Ferry and Son, Ltd., of Gateshead, from INFRINGING THEIR TRADE MARK in certain glass bottles. Mr. Hughes, K.C., for the defendants, said his clients only sent one bottle to indicate a certain size and shape, and the bottle happened to have the plaintiffs' trade mark on it. His Lordship said this seemed to him to be an isolated instance, and he ought not to grant an interlocutory injunction, and the motion would be refused.

A RESEARCH STUDENTSHIP of the annual value of £150 has been founded at Peterhouse, Cambridge, from the benefaction of the late Sir Charles Abercrombie Smith, formerly Fellow and Honorary Fellow of the College. The studentship will be awarded for one year. It is open to graduates of any British or foreign university, and the student elected is required to become a member of Peterhouse, if not already such. The first studentship will be awarded in the course of next July, tenure to begin on October 1, 1922. Applications should be sent to Mr. P. C. Vellacott, Tutor of Peterhouse, on or before July 10, accompanied by a statement of the proposed course of research, and of qualifications, with three testimonials.

A LIGHTNING STRIKE of some eighty drug and chemical workers in the employ of Willows Francis, Butler and Thompson, Ltd., Aldersgate Street, London, took place last week. It is alleged that owing to the employers' notice that the workers would be put on an hourly basis, thus reducing wages to 40s. and 50s. a week, work was stopped. Mr. F. Hawkins, organiser of the Drug and Chemical Workers' Union, met the employers, and as a result the notices were withdrawn, and the employers, it is reported, undertook to enter into negotiations with a view to placing their workers on the same terms of employment as prevail in the trade generally.

According to Henry Bath and Son's circular of May 31, prices of NITROGEN PRODUCTS have again been raised in Germany, being now M.54.50 for sulphates of ammonia and M.65.60 for nitrate of soda, per unit of nitrogen per 100 kilos, or about £9 and £8 per ton respectively.

The Railway Rates Advisory Committee will meet on Thursday and Friday next in Court A, Royal Courts of Justice, London, to hear objections which have been lodged to the railway companies' proposals for the CLASSIFICATION OF DANGEROUS GOODS carried by merchandise trains.

The Home Secretary has appointed Mr. Gerald Bellhouse, C.B.E., to the post of CHIEF INSPECTOR OF FACTORIES, which was recently rendered vacant by the death of Mr. Robert Ernest Graves, C.B.E. Mr. Bellhouse has been Deputy-Chief Inspector since 1917.

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GENERAL.—The business side of chemical manufacturing. Part II. C. Wadsworth. *Chem. and Met. Eng.*, May 17, 1922, pp. 920–922.

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ABSORPTION.—The absorption of nitrogen by calcium and its alloys. O. Ruff and H. Hartmann. *Z. anorg. u. allg. Chem.*, April 13, 1922, pp. 167–177.

ACIDS.—The influence of temperature and constitution on the velocity of decomposition of substituted malonic acids. H. Jakubowicz. *Z. anorg. u. allg. Chem.*, April 13, 1922, pp. 113–127.

RUBBER.—The hot vulcanisation of rubber. E. Kindscher. *Chem.-Zeit.*, May 18, 1922, pp. 441–443.

WOOD.—Practical experiences with wood-impregnating materials. R. Nowotny. *Z. angew. Chem.*, May 9, 1922, pp. 217–219.

SOAPS.—Properties of the sodium salts of the intermediate fatty acids. C. F. M. von Blumencron. *Z. Dent. Öl- u. Fett.-Ind.*; Part IV, March 9, 1922, pp. 155–158; Part V, March 16, 1922, pp. 171–174.

ORGANIC SELENIUM COMPOUNDS.—Organic derivatives of selenic acid. J. Meyer and W. Wagner. *Ber.*, May 13, 1922, pp. 1216–1222.

AMMONIA.—New apparatus for the preparation of ammonia and ammonium salts. O. Kausch. *Chem. Apparatur*; Part I, January 10, 1922, pp. 2–5; Part II, January 25, 1922, pp. 15–16.

COLLOIDS.—Plauson's colloid mill. B. Block. *Chem. Apparatur*; Part I, February 25, 1922, pp. 29–31; March 10, 1922, pp. 42–43.

ANALYSIS.—The quantitative estimation and separation of aluminium. G. Jander and E. Wendehorst. *Z. angew. Chem.*, May 23, 1922, pp. 244–247.

The use of aromatic compounds for the separation of metals in analysis. Part I. Separation of aluminium from iron using *o*-phenetidine. K. Chalupny and K. Breisch. *Z. angew. Chem.*, May 16, 1922, pp. 233–234.

Estimation of manganese. L. W. Winkler. *Z. angew. Chem.*, May 16, 1922, pp. 234–235.

Determination of cobalt in steel. A. Eder. *Chem.-Zeit.*, May 13, 1922, p. 430.

Miscellaneous

HYDROLYSIS.—Specific characteristics of hydrolytic decompositions. S. T. J. Tromp. *Rec. Trav. Chim. des Pays-Bas*, May 15, 1922, pp. 278–300.

HALOGEN COMPOUNDS.—The influence of some substituents in the benzene ring on the mobility of chlorine in the side-chain, and its relation with the problem of substitution in the benzene ring. S. C. J. Olivier. *Rec. Trav. Chim. des Pays-Bas*, May 15, 1922, pp. 301-311.

STEREO-CHEMISTRY.—Contributions to the knowledge of the configuration of ring systems in space. H. G. Derx. *Rec. Trav. Chim. des Pays-Bas*, May 15, 1922, pp. 312–342.

FERTILISERS.—The manufacture of nitrogenous fertilisers. Part II. O. Nydegger. *Bull. Fed. Ind. Chim. Belg.*, April, 1922, pp. 269–281.

CARBON.—Some compounds containing divalent carbon. A. Gillet. *Bull. Soc. Chim. Belg.*, April, 1922, pp. 126–131.

SILICATES.—Ideas on the chemical constitution of felspars; analysis of two microclines. E. Denaeyer. *Bull. Soc. Chim. Belg.*, April, 1922, pp. 131–147.

ANALYSIS.—The titration of potassium ferrocyanide by means of potassium permanganate. I. M. Kolthoff. *Rec. Trav. Chim. des Pays-Bas*, May 15, 1922, pp. 343–352.

Estimation of vanadium in steel. G. Misson. *Bull. Soc. Chim. Belg.*, April, 1922, pp. 123–126.

Patent Literature

Abstracts of Complete Specifications

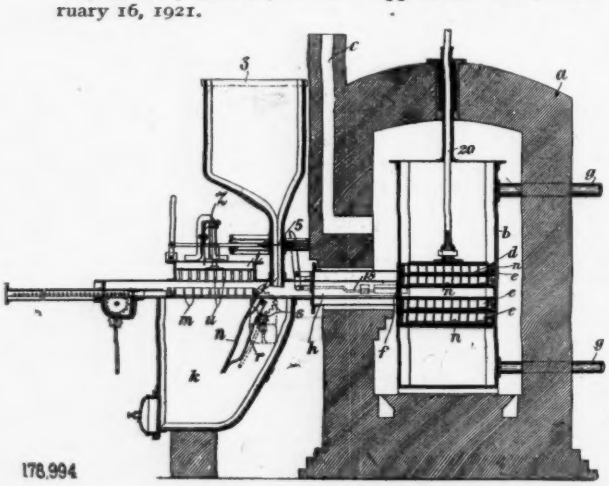
178,889. COKING THE DISCHARGED MATERIAL FROM LOW TEMPERATURE DISTILLATION APPARATUS, PROCESS AND APPARATUS FOR. E. Barrs, 6, South Square, Gray's Inn, London, W.C.1. Application date, December 23, 1920.

An inclined tubular retort is provided with means at the lower end for forcing the material upwards through it, and the column of material is divided into short lengths by means of pistons having the same diameter as the retort, arranged at intervals. The retort is heated by flues also arranged at intervals along its length alternately with jackets for withdrawing the gas generated. The material is thus coked in the form of briquettes having the same diameter as the retort. The same apparatus may be used for the low temperature distillation by supplying the heating gases at the required temperature.

178,952. COMBUSTION OF FUEL IN FURNACES WITH THE RECOVERY OF THE BY-PRODUCTS, PROCESS AND APPARATUS FOR. T. O. Wilton, Cyprus House, Hendon Lane, Finchley, London, N.3. Application date, January 28, 1921.

The process is for utilising the heat of the waste gases from furnaces, fire-boxes, etc., for extracting the by-product from the fuel before using it for heating the furnace. The furnace is arranged at the side of a vertical retort, and a single automatic stoker extends below both. The retort contains a central vertical perforated rotating tube carrying a helical conveyor which feeds the fuel downwards from a hopper at the top. When starting the plant, fuel is fed from the front of the furnace by the automatic stoker in the usual manner, and fuel is also fed downwards into the retort. The retort is gradually raised to a temperature of 850°–1,000° F. and the fuel distils, the gaseous products being drawn off through the central perforated pipe. When the plant is properly started, the mechanical stoker is reversed and the coked product from the retort is fed into the furnace at the hottest part of the grate. The process then becomes continuous. The gaseous products from the retort are passed through a condenser, an ammonia scrubber, a tar plant, and an ammonium sulphate plant. The waste gases may finally be returned to the furnace.

178,994. CARBONISATION OF COAL, SHALE, PEAT, AND OTHER MATERIALS. G. T. Beilby, 16 and 18, Old Queen Street, Westminster, London, S.W.1. Application date, February 16, 1921.



178,994

The material is carbonised in thin layers on shallow trays one above the other in a retort. The gas-fired oven *a* is fitted with a retort *b* having outlet pipes *g* for the gaseous products of distillation, while the combustion products are drawn off through an outlet *c*. A cage *d* supports a number of superposed trays *e*, and is capable of vertical movement by a rod 20 to bring each tray in succession opposite an opening *f*. A gas-tight passage-way *h* leads to a chamber *i* outside the oven, and each tray is drawn in succession into this chamber. Each tray is provided with a partition *m* to divide up the carbonised material, and with a hinged bottom *n* which may be swung downwards as shown. The carbonised material is discharged into a hopper *k* by means of rods *u* which may be reciprocated by means of a lever *z*. The door *n* is operated by a handle *r* and gearing *s*. With some classes of material the carbonised material may be discharged by tipping the tray. Each tray on its return movement is charged with fresh material from hopper 3 through a tube 4 controlled by a hand-operated sliding plate 5. The horizontal movements of the trays are effected by a sliding member 8 to which they are attached, this member being reciprocated by a pinion 13 engaging with a rack 12. The weight of the cage and its contents may be counterbalanced by placing two retorts in one oven and connecting the vertical rods 20 together by chains passing over pulleys. To ensure that the cage is in the correct position for the withdrawal of a tray, a locking device 18 is provided.

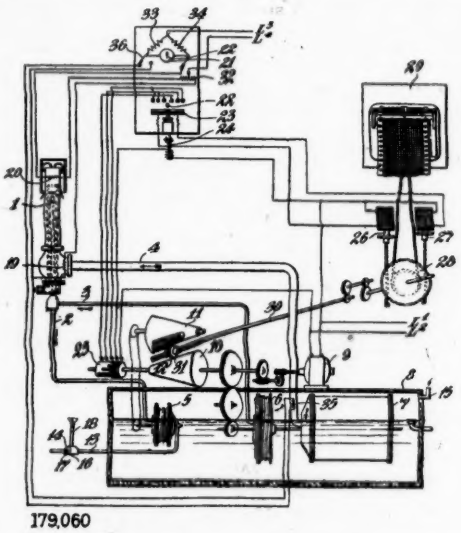
179,031. *o*-ALKYL DERIVATIVES OF HYDROCUPREINE, PROCESS FOR THE MANUFACTURE OF. Vereinigte Chininfabriken Zimmer & Co. G.m.b.H., 46, Darmstädterlandstrasse, Frankfurt-on-Main, Germany, and H. Thron, 43, Danneckerstrasse, Frankfurt-on-Main, Germany. Application date, March 16, 1921.

In the usual process for obtaining alkalised derivatives of hydrocupreine by treating hydrocupreine with alkylising means, a hydrogen atom of the phenol hydroxyl group of hydrocupreine is replaced by an alkyl, and alkyl is also attached to a nitrogen atom of the base, so that ammonium bases are produced and the yield of hydrocupreines is reduced. In the present process hydrocupreine is oxidised and then alkylised so that the nitrogen atom is protected by combination with an oxygen atom, and no ammonium bases are produced. The resulting alkyl hydrocupreine oxides are reduced to alkyl hydrocupreines, and a higher yield is thus obtained. The hydrocupreine oxide may be obtained by treating hydrocupreine with hydrogen peroxide, and the product is then treated with alkylising means such as diethyl sulphate or ethylene chloride. Detailed examples are given of the production of the pure product.

179,060. CALORIFIC VALUE OF COMBUSTIBLE GASES OR OTHER CHEMICALLY REACTIVE AGENTS, METHOD OF AND APPARATUS FOR MEASURING. Igranic Electric Co., Ltd., 147, Queen Victoria Street, London, E.C.4. From The Cutler-Hammer Manufacturing Co., Milwaukee, Wis., U.S.A. Application date, April 7, 1921.

The process is for determining the calorific value of two reacting gases by maintaining them in constant volumetric proportions and determining the heating effect on a constant proportion of cooling air. Gas is supplied by a pump 5, combustion air by a pump 6, and cooling air by a pump 7, all of which are geared together and driven by a motor 9 so that their speed ratios remain constant. The combustible gases are burned in the inner tube of a device 1, and the heat is transferred to the cooling air which circulates in the outer part of the device 1. The constant rise of temperature of the cooling air is measured by two electric resistance thermometers 19, 20, placed at the inlet and outlet respectively. These resistances are connected to a Wheatstone bridge, a galvanometer, and a recording apparatus. The pumps 5, 6, 7, are separate wet displacement meters immersed in a tank 8, so that the gases are delivered under uniform conditions of temperature, pressure and saturation. If the proportions of gas and air are so adjusted that complete chemical union takes place, any variation of the heating value of the gas will cause a corresponding variation in the rise of temperature of the cooling air. The comparison between different gases may be made more accurately, if, instead of measuring the increase of temperature of the cooling air, this increase is kept constant by varying the proportions

of gas and combustion air. The proportion of gas necessary to maintain this constant rise of temperature thus constitutes a measure of the calorific value of the gas. This variation in the supply of gas is effected by two opposed cone pulleys

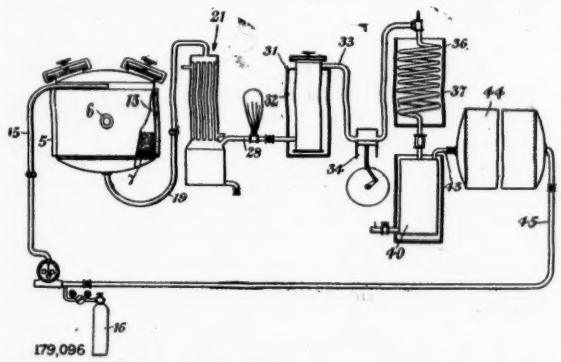


179,060

10, 11, the drive being transmitted by means of a movable idler 12. The position of the idler determines the proportion of the gas supplied, and therefore the calorific value.

179,096. HYDROCYANIC ACID, METHOD OF PRODUCING. H. G. C. Fairweather, London. From Air Reduction Co., Inc., 342, Madison Avenue, New York. Application date, July 6, 1921.

When alkali metal cyanides are treated with carbon dioxide in the presence of water, hydrocyanic acid is produced, but the yield is usually small owing to polymerisation of the hydrocyanic acid, the polymer remaining in the cyanide material. It has now been found that the polymerisation is due to the continued presence of the hydrocyanic acid with the reacting material, and that if the hydrocyanic acid is withdrawn continuously as soon as produced, polymerisation



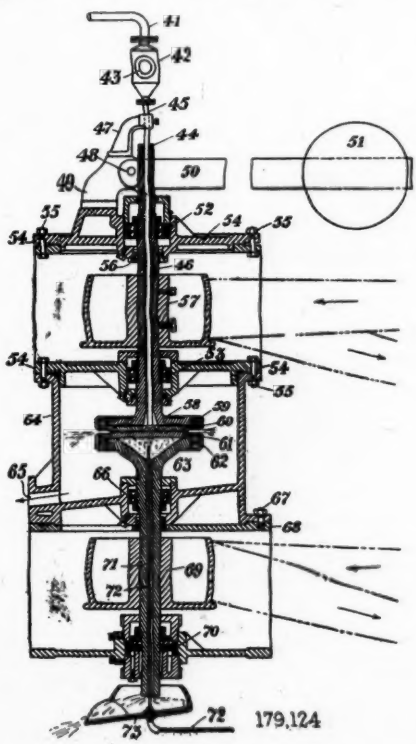
179,096

does not occur, and a high yield is obtained. The raw material, which may be alkali metal cyanide or material containing cyanide, is ground and mixed with 5–20 per cent. of water in a mixing device. This material is placed in a reaction chamber 5 supported on trunnions 6 and provided near the bottom with a screen 7 consisting of a perforated metal sheet covered by several layers of wire mesh fabric and a sheet of filter cloth. A water jacket 13 may be provided to cool the walls of the chamber before supplying the new charge, but cooling is not necessary during the reaction. Carbon dioxide is supplied from a cylinder 16 through a pipe 15 to the upper part of the chamber, and passes downwards through the charge so that the hydrocyanic acid liberated, mixed with carbon dioxide and water vapour, passes through the pipe 19 to a condenser 21. The carbon dioxide is employed in the proportion of 1·5–3 times that theoretically necessary for the reaction. The condenser 21 is cooled by circulating water at such a temperature that only moisture is condensed. The gases then pass through a pipe 28 to a drier 31 containing sodium bisulphate or calcium chloride, to absorb the remaining moisture. The drier is surrounded by a jacket 32 heated to about 30°–50° C. to prevent condensation of hydrocyanic acid. The gas then passes through a pipe 33 to a compressor 34, and thence to a coil 36 in a cooling bath 37 to condense the hydrocyanic acid, which then passes to a vessel 40 surrounded by a cooling jacket. The carbon dioxide passes through a pipe 43 to a pressure storage tank 44 and then by a pipe 45 back to the system. The condensed hydrocyanic acid is chemically pure, and may be used in the production of cyanides or for cyanide reactions.

179,108. ACTIVE WOOD CHARCOAL, PROCESS FOR THE MANUFACTURE OF. W. Carpmael, London. From Chemische Fabrik auf Actien vorm. E. Schering, 170–171, Mullerstrasse, Berlin, N.39. Application date, August 24, 1921.

Wood in a granular state is carbonised at a moderate temperature, and the charcoal is subjected to a partial vacuum of 720 mm. for half an hour at a temperature of 20° C. The charcoal is then impregnated with a solution of potassium carbonate in water and then dried and heated to bright redness for two hours. The alkali is then dissolved out in water and the charcoal dried at about 80° C. Caustic alkalies may be used instead of potassium or other alkali carbonate, but in this case the temperature to which the charcoal is heated may be lower.

179,124. COLLOIDAL DISPERSIONS, APPARATUS FOR PRODUCING. W. P. Thompson, Liverpool. From H. O. Traun's Forschungslaboratorium G.m.b.H., Huxter 14, Hamburg, Germany. Application date, December 24, 1920.



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The apparatus for producing colloidal dispersions consists of a mill having adjacent surfaces which are rotated relatively to one another at a speed of 1,000 to 2,000 metres per minute under heavy pressure. One of the friction surfaces 60 is fixed to a disc 58 carried by the spindle 46, by means of a screwed

sleeve 59. The other friction surface 61 is similarly fixed to the spindle 71 by the screwed sleeve 62. The spindle 46 is supported in bearings 52, 53, and the spindle 71 is supported in bearings 66 and 70. The two friction discs are driven in opposite directions by means of belt pulleys 57 and 69 respectively. The dispersion material is forced under high pressure through a pipe 41 and a vessel 42 provided with an inspection opening 43, and thence through a pipe 45 passing through the hollow spindle 46 to the friction surfaces. The pressure between these surfaces is obtained by means of a lever 50 pivoted at 48 and carrying a weight 51, the position of which may be varied to vary the pressure between the friction surfaces. The ground material discharged from these surfaces is received in a receptacle 64, from which it passes by a passage 65 back to the pump. Cooling water is supplied to the lower friction surface by a pipe 72 passing through the hollow shaft 71, and the water returns through the spindle 71 to a vessel 73. Leakage of the dispersion material from the top of the spindle 46 is prevented by a stuffing box 44. The outlet pipe is provided with a filter comprising a series of superposed slotted plates pressed together by a screw and having the slots in adjacent plates at an angle to one another. This apparatus is suitable for obtaining colloidal dispersions as described in Specification No. 155,836 (see THE CHEMICAL AGE, Vol. VIII, p. 313), *e.g.*, colloidal dispersions of cellulose and the like.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—154,213 (E. Slatineau), relating to obtaining reactions between a gas and another substance, see Vol. IV., p. 165; 159,143 (Trent Process Corporation), relating to treating ore and like materials, see Vol. IV., p. 541; 159,193 (P. Brat), relating to recovery of nitrogen in the form of ammonia, see Vol. IV., p. 541; 161,560 (Trent Process Corporation), relating to collecting and purifying minerals, see Vol. IV., p. 678; 169,145 (Chemische Fabriken Worms Akt.-Ges.), relating to manufacture of anthraquinone, see Vol. V., p. 603; 171,074 (E. Slatineanu), relating to a catalytic process for obtaining reactions between a gas and another substance, see Vol. V., p. 846.

International Specifications not yet Accepted

177,777. SYNTHETIC AMMONIA. Soc. Chimique de La Grande-Paroisse, Azote et Produits Chimiques, 13, Rue des Saussaies, Paris. International Convention date, March 31, 1921.

In the catalytic synthesis of ammonia under very high pressures, the reaction tube is constructed of iron with a low carbon content. The portion subject to the highest temperatures is strengthened by external rings or a sleeve of stronger metal. In one example, the iron of the tube contained: Silicon, 0·018 per cent.; sulphur, 0·09 per cent.; carbon, 0·098 per cent.; and manganese, 0·93 per cent.

LATEST NOTIFICATIONS.

180,292. Process for converting silver prints into colour pictures. Akt.-Ges., für Anilin-Frabrikation. May 17, 1921.
180,314. Synthesis of ammonia. Nitrogen Corporation. May 17, 1921.
180,326. Production of aluminium. Blasi, M. May 18, 1921.

Specifications Accepted, with Date of Application

156,799. Nitrous gases, Manufacture of concentrated. Norsk Hydro-Elektrisk Kvaelstofaktieselskab. October 6, 1915.
156,800. Nitrous gases into concentrated nitric acid, Process of converting. Norsk Hydro-Elektrisk Kvaelstofaktieselskab. May 22, 1915.
157,836. Rubber substitute and process for producing same. Western Rubber Co. March 16, 1918.
157,860. Zinc white, Manufacture of. C. Clerc and A. Nihoul. November 15, 1919.
158,906. Alcohol, Manufacture of. Badische Anilin und Soda Fabrik. February 9, 1920.
160,759. Aluminium chloride, Production of. Armour Fertilizer Works. March 24, 1920.
163,330. Nitrate of calcium, Process for the manufacture of. Aluminium Industrie Akt.-Ges. May 19, 1920.
164,310. Illuminating gas, Manufacture of. Soc. du Gaz de Paris. June 4, 1920.
164,719. Sodium cyanide, Process for the production of. Deutsche Gold and Silber Scheide-Anstalt vorm. Rössler. June 10, 1920.
179,586. Plastic materials, Manufacture of. W. Petersen and E. V. Clark. January 11, 1921.
179,610. Hydrocarbons, Process for refining. J. Demant. February 4, 1921.
179,622. Rubber, Treatment of raw. F. G. McGuire, A. Agar, and H. T. Coulter. February 5, 1921.
179,643. Carbonaceous fuel, Apparatus for the complete gasification of. J. F. Simpson. February 8, 1921.
179,644. Hydrocarbon oils, Process for distilling and cracking. S. L. Gartlan and A. E. Gooderham. February 8, 1921.
179,645. Petroleum oils, Apparatus for distillation and cracking of. S. L. Gartlan and A. E. Gooderham. February 8, 1921.
179,674. Kilns. G. Hughes. (*Deutsche Evaporator Akt.-Ges.*) February 14, 1921.
179,716. Gas generators for generating low-grade gas. J. Pierson and O. G. Pierson. February 24, 1921.
179,723. Sulphate of ammonia and other chemical salts, Apparatus for drying. J. B. Hansford. March 1, 1921.
179,745. Distillation columns. C. Still (Firm of) and H. Petsch. March 15, 1921.
179,753. Amino-phenols or aromatic amino-acids, Production of. W. Lewcock, W. G. Adam, N. E. Siderfin, and W. L. Galbraith. March 19, 1921.

Applications for Patents

Akt.-Ges. für Anilin-Fabrikation. Method of protecting animal fibre treated with alkaline liquids. 14641. May 24. (Germany, June 15, 1921.)
Balke, P., and Leysieffer, G. Process for manufacture of articles from cellulose derivatives. 14637. May 24. (Germany, June 17, 1921).
Blattner, R. H. D., and Grouchkine, L. Manufacture of caustic soda. 14913. May 26.
—— Process for making carbon dioxide suitable for liquefaction. 14914. May 26.
Coke & Gas Ovens, Ltd., and Stille, C. Apparatus for dehydrating tar. 14407. May 22.
—— Apparatus for production of neutral ammonium sulphate. 14408. May 22.
Constantinesco, G. Method of pulverising or atomising liquids. 14723. May 25.
Danks, A. Retorts for recovery of by-products from coal and oil shale, &c., and for cracking oils. 14802. May 26.
Dreyfus, H. Manufacture of cellulose derivatives. 14610. May 24.
Farbwerke vorm. Meister, Lucius, & Brüning. Manufacture of sulphonic acids of the 2 : 3-oxynaphthoic acid arylides. 14537. May 23. (Germany, July 19, 1921.)
Ferguson, J. B. P. Manufacture of calcium lactate and lactic acid from fermentable sugar solutions. 14592. May 24.
Haigh, A. Carbon, &c., coated papers and carbonising papers. 14973. May 27.
Hodgkinson, W. R., and Ridge, H. M. Process of purifying oils, &c. 14424. May 22.
—— Treatment of oils, and materials therefor. 14425. May 22.
Kalle & Co., Akt.-Ges., and Sokal, S. Process for producing vat dye-stuffs and their starting products. 14726. May 25.
Laing, B., and Nielsen, H. Distillation of carbonaceous, &c., materials. 14784. May 25.
New Jersey Zinc Co. Manufacture of zinc oxide. 14619. May 24. (United States, May 27, 1921.)
Pearson & Co., Ltd., E. T., and Clark, T. W. F. Process for producing a potent preparation of vitamin A. 14401. May 22.
Plauson's (Parent Co.), Ltd., and Plauson, H. Process for treating mineral oils. 14337. May 22.
Soc. Anon. Produits Chimiques et Engrais L. Bernard. Fertilisers. 14779. May 25. (Belgium, April 27.)
Soc. Chimique des Usines du Rhône. Process for preparation of basic salicylate of alumina. 14655. May 24. (Germany, June 28, 1921).
Yeates, G. R. Stirrers or mixers for laboratory, &c., use. 14576. May 24.

Patents Court Cases

APPLICATIONS have been made under Section 24 of the Patents and Designs Acts 1907 and 1919 for the following patents to be indorsed "Licenses of Right":—17,770/1910 (A. S. Ramage), relating to lead pigments and method of making same; 124,638 (China Sugar Refining Co., Ltd., and others), relating to decolorising carbon and the preparation thereof.

Variation of Cartridge Diameters

AT the Pittsburg, Pa., experiment station of the U.S.A. Bureau of Mines co-operative work with the Institute of Makers of Explosives on the variation of cartridge diameters is in progress. A study is being made of the strength and sensitiveness of certain high explosives as determined by the rate of detonation and gap tests. The results obtained show, in general, that the rate of detonation and sensitiveness by gap tests increase with increased diameter of the cartridge.

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to* THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.

LONDON, JUNE 1, 1922.

THERE has been a substantial inquiry for chemicals generally against home trade requirements, but the actual up-take is somewhat diminished, in the industrial districts particularly, and the holiday atmosphere is apparent.

On the whole, however, the outlook is not unsatisfactory, and price changes are, with a few exceptions, in an upward direction. Export demand has been fair, but is lamentably lacking in volume.

General Chemicals

ACETONE.—Practically all the available supplies on the spot have been snapped up, and as surplus goods now appear to have been absorbed the forward tendency is much firmer.

ACID ACETIC has been an active market, and supplies are scarce for prompt delivery. Some sales for forward delivery have been made at rather low prices, but on the whole the market is firm.

ACID FORMIC has been in better demand; price unchanged.

LACTIC ACID remains uninteresting.

ACID OXALIC is a slow but steady market, and the full effect of the import duty is now being felt.

BARIUM CHLORIDE is very scarce, the market being firm in all positions.

CREAM OF TARTAR is a firm market and inclined to advance.

COPPER SULPHATE is unchanged.

FORMALDEHYDE remains influenced by the lack of demand, although intrinsically the article is worth more money. Many of the makers are running at a loss.

LEAD ACETATE is in good demand, and prices are advancing.

LEAD NITRATE.—A rather better business is passing, but the turnover is still very small.

LITHOPONE is firm, and higher prices are anticipated.

POTASSIUM CARBONATE continues to favour buyers.

POTASSIUM CAUSTIC.—The stocks still hang fire, and buyers are able to drive special bargains.

POTASSIUM PERMANGANATE is firm, and a steady trade of small dimensions is passing.

POTASSIUM PRUSSIATE is scarce for both prompt and forward delivery, and the supplies of the same are influenced by the rise in the soda salt.

SODIUM ACETATE is substantially advanced in price, and many of the manufacturers are sold out for some months ahead.

SODIUM BICHROMATE remains a weak and generally unsatisfactory market.

SODIUM NITRATE.—There has been a considerable improvement in the demand, but the turnover is insufficient to influence the price.

SODIUM PHOSPHATE is unchanged.

SODIUM PRUSSIATE.—An active business has been passing for delivery over the remaining months of the year. Supplies are very scarce, and a further advance in price has occurred.

WHITE LEAD is unchanged.

ZINC OXIDE is scarce, and the price is firm.

Coal Tar Intermediates

Trade continues on better lines, with interest both on home and export account.

ALPHA NAPHTHOL is firm at last quoted figures.

ALPHA NAPHTHYLAMINE is firmer, with some fair inquiries in the market.

ANILINE OIL and SALT are unchanged.

BENZIDINE BASE is quiet.

BETA NAPHTHOL.—Inquiry is good, and spot lots are scarce.

CHLORBENZOL has been inquired for.

DIMETHYLANILINE is steady, without change in value.

DIPHENYLAMINE is very firm, but actual business is on small lines.

"H" ACID is firm, with demand good.

NAPHTHIONIC ACID continues to pass regularly into consumption.

NITROBENZOL.—The usual orders have been received.

PARANITRANILINE is featureless.

"R" SALT is the turn easier.

XYLIDINE is steady.

Coal Tar Products

There is little change to report in the market for coal tar products since last week. Benzols and naphthas continue in a weak condition, while the improvement reported in cresylics, creosotes and carbolics is more than maintained.

90's BENZOL is not worth more than 2s. per gallon on rails.

PURE BENZOL is in poor demand, and is quoted at 2s. 4d. per gallon.

CREOSOTE OIL is scarce for prompt delivery, and is worth about 4¾d. on rails in the Midlands and 5¼d. to 5½d. per gallon on rails in London.

CRESYLIC ACID is well bought for prompt delivery, and a considerable amount of speculative buying for delivery over the next three months has been going on. The Pale quality, 97/99%, is worth about 2s. 4d. per gallon, while the Dark quality, 95/97%, is worth about 2s. 1d.

SOLVENT NAPHTHA can be bought freely at 1s. 8d.

HEAVY NAPHTHA is worth about 1s. 9d. per gallon on rails.

NAPHTHALENE is uninteresting, and there is no change in price.

PITCH.—There is still some inquiry for parcels for prompt shipment, but the hot weather makes holders indifferent about undertaking deliveries. There is no change in the price for prompt, which remains at 67s. 6d. to 69s. per ton f.o.b. East Coast, and 70s. to 72s. 6d. f.o.b. London. Some contracts for forward delivery have been entered into at a discount on the above prices, but no great interest is shown in that position yet.

Sulphate of Ammonia

There is no change in the position, and little business has transpired.

Current Prices

Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	1	8	to	0	1	10
Acetone oil	ton	77	10	0	to	80	0	0
Acetone, pure	ton	72	0	0	to	73	0	0
Acid, Acetic, glacial, 99–100%	ton	66	0	0	to	67	0	0
Acetic, 80% pure	ton	43	0	0	to	44	0	0
Arsenic, liquid, 2000 s.g.	ton	67	0	0	to	70	0	0
Boric, cryst.	ton	60	0	0	to	65	0	0
Carbolic, cryst. 39–40%	lb.	0	0	6	to	0	0	6¼
Citric	lb.	0	2	4	to	0	2	5
Formic, 80%	ton	65	0	0	to	66	0	0
Gallic, pure	lb.	0	2	11	to	0	3	0
Hydrofluoric	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol.	ton	40	0	0	to	43	0	0
Lactic, 60 vol.	ton	43	0	0	to	45	0	0
Nitric, 80 Tw.	ton	30	0	0	to	31	0	0
Oxalic	lb.	0	0	8¾	to	0	0	8½
Phosphoric, 1.5	ton	38	0	0	to	40	0	0
Pyrogallic, cryst.	lb.	0	6	0	to	0	6	3
Salicylic, Technical	lb.	0	0	10½	to	0	1	0
Salicylic, B.P.	lb.	0	1	3	to	0	1	5
Sulphuric, 92–93%	ton	7	10	0	to	8	0	0
Tannic, commercial	lb.	0	2	3	to	0	2	9
Tartaric	lb.	0	1	4¼	to	0	1	4½
Alum, lump	ton	13	0	0	to	14	0	0
Alum, chrome	ton	28	0	0	to	29	0	0
Alumino ferric	ton	9	0	0	to	9	5	0
Aluminium, sulphate, 14–15%	ton	10	10	0	to	11	0	0
Aluminium, sulphate, 17–18%	ton	11	10	0	to	12	0	0

	Per	£	s.	d.		£	s.	d.
Ammonia, anhydrous	lb.	0	1	8	to	0	1	10
Ammonia, .880	ton	33	0	0	to	35	0	0
Ammonia, .920	ton	21	0	0	to	23	0	0
Ammonia, carbonate	lb.	0	0	4	to	0	0	4½
Ammonia, chloride	ton	60	0	0	to	65	0	0
Ammonia, muriate (galvanisers)	ton	35	0	0	to	37	10	0
Ammonia, nitrate (pure)	ton	35	0	0	to	40	0	0
Ammonia, phosphate	ton	78	0	0	to	80	0	0
Ammonia, sulphocyanide	lb.	0	1	10	to	0	2	0
Amyl acetate	ton	175	0	0	to	185	0	0
Arsenic, white, powdered	ton	42	0	0	to	44	0	0
Barium, carbonate, 92–94%	ton	12	10	0	to	13	0	0
Barium, Chlorate	ton	60	0	0	to	68	0	0
Barium Chloride	ton	19	0	0	to	20	0	0
Nitrate	ton	27	10	0	to	30	0	0
Sulphate, blanc fixe, dry	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp	ton	10	5	0	to	10	10	0
Sulphocyanide, 95%	lb.	0	1	0	to	0	1	3
Bleaching powder, 35–37%	ton	13	0	0	to	13	10	0
Borax crystals	ton	29	0	0	to	33	0	0
Calcium acetate, Brown	ton	9	0	0	to	9	10	0
" " Grey	ton	13	0	0	to	13	10	0
Calcium Carbide	ton	16	0	0	to	17	0	0
Chloride	ton	6	10	0	to	7	0	0
Carbon bisulphide	ton	50	0	0	to	52	0	0
Casein, technical	ton	50	0	0	to	65	0	0
Cerium oxalate	lb.	0	4	6	to	0	4	9
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	6	0	to	0	6	6
Oxide, black	lb.	0	9	6	to	0	10	0
Copper chloride	lb.	0	1	2	to	0	1	3
Sulphate	ton	28	10	0	to	29	0	0
Cream Tartar, 98–100%	ton	115	0	0	to	117	10	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol.	ton	67	10	0	to	70	0	0
Formusol (Rongalite)	lb.	0	2	6	to	0	2	9
Glauber salts, commercial	ton	5	10	0	to	6	0	0
Glycerine, crude	ton	70	0	0	to	72	0	0
Hydrogen peroxide, 12 vols.	gal.	0	2	5	to	0	2	6
Iron perchloride	ton	30	0	0	to	32	0	0
Iron sulphate (Copperas)	ton	4	0	0	to	4	5	0
Lead acetate, white	ton	42	0	0	to	43	0	0
Carbonate (White Lead)	ton	42	0	0	to	46	0	0
Nitrate	ton	46	10	0	to	48	10	0
Litharge	ton	35	10	0	to	36	0	0
Lithopone, 30%	ton	25	10	0	to	26	0	0
Magnesium chloride	ton	10	0	0	to	10	10	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	8	0	0	to	8	10	0
Sulphate (Druggists')	ton	13	10	0	to	14	10	0
Manganese, Borate	ton	65	0	0	to	70	0	0
Sulphate	ton	60	0	0	to	62	0	0
Methyl acetone	ton	60	0	0	to	65	0	0
Alcohol, 1% acetone	ton	65	10	0	to	66	0	0
Nickel sulphate, single salt	ton	49	0	0	to	51	0	0
Ammonium sulphate, double salt	ton	51	0	0	to	52	0	0
Potash, Caustic	ton	33	0	0	to	34	0	0
Potassium bichromate	lb.	0	0	6¾	to		—	
Carbonate, 90%	ton	31	0	0	to	33	0	0
Chloride, 80%	ton	12	0	0	to	12	10	0
Chlorate	lb.	0	0	4½	to	0	0	5
Meta bisulphite, 50–52%	ton	84	0	0	to	90	0	0
Nitrate, refined	ton	45	0	0	to	47	0	0
Permanganate	lb.	0	0	9	to	0	0	10
Prussiate, red	lb.	0	4	6	to	0	4	9
Prussiate, yellow	lb.	0	1	3	to	0	1	3½
Sulphate, 90%	ton	13	0	0	to	13	10	0
Salammoniac, firsts	cwt.	3	3	0	to		—	
Seconds	cwt.	3	0	0	to		—	
Sodium acetate	ton	23	10	0	to	24	10	0
Arseniate, 45%	ton	45	0	0	to	48	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	5¼	to		—	
Bisulphite, 60–62%	ton	23	0	0	to	24	0	0
Chlorate	lb.	0	0	3¾	to	0	0	4
Caustic, 70%	ton	22	10	0	to	23	0	0
Caustic, 76%	ton	25	0	0	to	25	10	0
Hydrosulphite, powder, 85%	lb.	0	1	9	to	0	2	0
Hyposulphite, commercial	ton	13	10	0	to	14	0	0
Sodium Nitrite, 96–98%	ton	31	0	0	to	32	0	0
Phosphate, crystal	ton	18	10	0	to	19	0	0
Perborate	lb.	0	0	11	to	0	1	0
Prussiate	lb.	0	0	10½	to	0	0	11
Sulphide, crystals	ton	13	0	0	to	14	0	0
Sulphide, solid, 60–62%	ton	21	10	0	to	23	10	0
Sulphite, cryst.	ton	12	10	0	to	13	0	0
Strontium carbonate	ton	55	0	0	to	60	0	0
Strontium Nitrate	ton	45	0	0	to	47	10	0
Strontium Sulphate, white	ton	6	10	0	to	7	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Sulphur, Flowers	ton	13	0	0	to	14	0	0
Roll	ton	13	0	0	to	14	0	0
Tartar emetic	lb.	0	1	6	to	0	1	7
Tin perchloride, 33%	lb.	0	1	2	to	0	1	4
Perchloride, solid	lb.	0	1	5	to	0	1	7
Protochloride (tin crystals)	lb.	0	1	5	to	0	1	6
Zinc chloride 102° Tw.	ton	21	0	0	to	22	10	0
Chloride, solid, 96–98%	ton	25	0	0	to	30	0	0
Oxide, 99%	ton	36	0	0	to	38	0	0
Dust, 90%	ton	45	0	0	to	47	10	0
Sulphate	ton	18	10	0	to	19	10	0

Coal Tar Intermediates, &c.

	Per	£	s.	d.		£	s.	d.
Alphanaphthol, crude	lb.	0	2	3	to	0	2	6
Alphanaphthol, refined	lb.	0	3	0	to	0	3	3
Alphanaphthylamine	lb.	0	2	0	to	0	2	1
Aniline oil, drums extra	lb.	0	1	0	to	0	1	1
Aniline salts	lb.	0	1	1	to	0	1	2
Anthracene, 40–50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	3	9	to	0	4	3
Benzidine, base	lb.	0	5	9	to	0	6	0
Benzidine, sulphate	lb.	0	5	9	to	0	6	0
Benzoic acid	lb.	0	1	7½	to	0	1	9
Benzoate of soda	lb.	0	1	6	to	0	1	7
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate	lb.	0	4	9	to	0	5	0
Betanaphthol	lb.	0	1	4	to	0	1	4½
Betanaphthylamine, technical	lb.	0	6	0	to	0	7	0
Croceine Acid, 100% basis	lb.	0	3	6	to	0	3	9
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	2	9	to	0	3	0
Dinitrobenzol	lb.	0	1	3	to	0	1	4
Dinitrochlorbenzol	lb.	0	0	11	to	0	1	0
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	5	to	0	1	6
Dinitrophenol	lb.	0	2	9	to	0	3	0
Dimethylaniline	lb.	0	2	3	to	0	2	6
Diphenylamine	lb.	0	4	3	to	0	4	6
H-Acid	lb.	0	6	6	to	0	7	0
Metaphenylenediamine	lb.	0	5	6	to	0	5	9
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	6	0	to	0	6	6½
Monosulphonic Acid (2.7)	lb.	0	5	6	to	0	6	0
Naphthionic acid, crude	lb.	0	3	0	to	0	3	3
Naphthionate of Soda	lb.	0	3	0	to	0	3	3
Naphthylamin-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Neville Winther Acid	lb.	0	7	9	to	0	8	0
Nitronaphthalene	lb.	0	1	4	to	0	1	5
Nitrotoluol	lb.	0	1	0	to	0	1	2
Orthoamidophenol, base	lb.	0	10	0	to	0	10	5
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	1	6	to	0	1	9
Orthonitrotoluol	lb.	0	0	10	to	0	1	0
Para-amidophenol, base	lb.	0	10	0	to	0	10	6
Para-amidophenol, hydrochlor	lb.	0	10	6	to	0	11	0
Paradichlorbenzol	lb.	0	0	6	to	0	0	7
Paranitraniline	lb.	0	3	6	to	0	3	9
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	5	0	to	0	5	3
Paraphenylenediamine, distilled	lb.	0	10	6	to	0	10	9

French Potash

THE Alsace-Lorraine Trading Co. report: Buyers are interested in securing stocks at favourable prices for the autumn fertiliser season, but the turnover for the time being is somewhat limited. Prices are now so low that preferential rates quoted show only insignificant differences. On recent consignments the unit values of the different grades remain practically unaltered, and it is doubtful if any considerable concessions can be made on orders for future delivery Supp lies of muriate and sulphate of potash are plentiful.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

GLASGOW, MAY 31, 1922.

BUSINESS during the past week has been fairly well maintained, but the tendency towards improvement has not been sustained to the extent hoped for.

Prices remain steady and there is little of importance to record.

In coal tar products, benzol is offering at lower prices.

Industrial Chemicals

ACID ACETIC.—Supplies for spot delivery are still limited and consequently prices are well maintained. Glacial quoted £58 per ton, c.i.f. British makers quote £62 per ton; 80% technical quoted £37 to £38 per ton c.i.f.

ACID BORACIC.—Crystal or granulated £60 per ton. Powdered, £62 per ton. Fair inquiry for export.

ACID CARBOLIC.—In moderate demand. Quoted 6d. per lb.

ACID HYDROCHLORIC.—Price unchanged, 6s. 6d. per carboy ex works. Still in poor demand.

ACID OXALIC.—A few inquiries. Price 8¼d. to 8½d. per lb.

ACID SULPHURIC.—Makers' prices unchanged. 144° Tw., £4 per ton; 168°, £7 5s. per ton; de-arsenicated, £1 per ton more.

ACID TARTARIC.—Supplies for prompt delivery scarce; quoted 1s. 3d. to 1s. 4d. per lb.

ALUMINA SULPHATE.—English make for export, 14/15%, £8 5s. per ton; 17/18%, £10 per ton f.o.b.

ALUM (LUMP POTASH).—Continental make £15 5s. to £15 10s. ex store. Cheaper offers of £11 10s. c.i.f.

AMMONIA, ANHYDROUS.—Quoted 1s. 8d. to 1s. 9d. per lb. delivered. In little request.

AMMONIA, LIQUID, 880°.—Small local inquiry; 3½d. to 4d. per lb. ex works.

AMMONIA MURIATE.—Maker's price, £34 per ton, f.o.r.

AMMONIA SALAMMONIAC (CRYSTALS).—Price inclined to be easier, at about £56 to £57 per ton.

AMMONIA SULPHATE.—25¼%, £15 10s.; 25¾% neutral, £16 13s. per ton ex works, May delivery.

ARSENIC, WHITE POWERED.—Moderate demand. Price, £44 per ton ex quay.

BARIUM CHLORIDE.—Good export inquiry. Quoted about £19 to £20 per ton f.o.b.

BARYTES.—In little request; price from £3 15s. for grey, up to £5 15s. for finest white, f.o.r. works.

BLEACHING POWDER.—Small local inquiry. £14 per ton ex station.

BORAX.—Crystal or granulated, £29 per ton; powdered, £30 per ton. Usual local demand, and a few inquiries for export.

CALCIUM CHLORIDE.—English makers' price, £6 10s. per ton. Continental offers of £5 15s. c.i.f.

COPPERAS.—Quoted £3 15s. to £4 per ton ex works.

FORMALDEHYDE, 40%.—Very little inquiry. Price, £68 to £69 per ton.

GLAUBER SALTS.—Moderate inquiry. Spot lots, £5 per ton ex store.

LEAD.—Red, £36 10s. per ton delivered; white, £50 10s. per ton delivered.

MAGNESITE, GROUND CALCINED.—Spot lots, £12 10s. per ton ex store. In little demand.

MAGNESIUM CHLORIDE.—Spot lots quoted £7 to £7 10s. ex store. Continental offers of £6 per ton, c.i.f. U.K.

NAPHTHALENE.—Sublimed flakes on offer at £16 10s. per ton ex works.

POTASSIUM BICHROMATE.—British makers' price, 6¾d. per lb. delivered. Cheaper lots to be had at 6¼d.

POTASSIUM CARBONATE, 88/92%.—Spot lots at £29 per ton ex store.

POTASSIUM CAUSTIC, 88/92%.—Price remains unchanged at £33 to £34 per ton.

POTASSIUM CHLORATE.—Quoted 4½d. to 5d. per lb. In little demand.

POTASSIUM NITRATE.—Spot lots, £35 per ton ex store.

POTASSIUM PRUSSIATE, YELLOW.—Fair inquiry, and price firm at 1s. 3d. per lb.

SODIUM BICARBONATE.—Makers' price unchanged, £11 ex station. M.W. quality, £10 ex station.

SODIUM BICHROMATE.—English make, 5¼d. per lb. delivered.

SODIUM CAUSTIC.—76/77%, £25 10s.; 70/72%, £23 10s.; 60%, £26 5s.; 98/99%, powdered, £29 to £30 per ton ex station. Fair inquiry for export.

SODIUM CHLORATE.—Offering at 2⅞d. per lb. c.i.f. U.K. port, packed in free calico-lined iron drums.

SODIUM HYPOSULPHITE.—Commercial quality, £14 to £14 10s.; pea crystals, £20 10s. to £21 per ton. Moderate inquiry for pea crystals.

SODIUM NITRATE.—A few export inquiries, £14 15s. per ton f.o.b. Refined quality, £15 per ton f.o.b.

SODIUM NITRITE, 100%.—Price firmer, at £31 per ton.

SODIUM PRUSSIATE, YELLOW.—Price, 9½d. per lb. ex store.

SODIUM SILICATE, 140°.—Practically no demand. £10 to £11 per ton ex station.

SODIUM SULPHATE (Saltcake, 95%).—Quantity available for export; offered at £3 15s. f.o.b. U.K. port.

SODIUM SULPHIDE, 60/65%.—Moderate inquiry. Solid, £21 per ton ex station; broken, £2 per ton more.

SULPHUR.—Flowers, £14; ground, £13; rock, £12; roll, £13. A few inquiries for ground quality. Government stocks of Sicilian thirds still available at £4 5s. to £4 15s., according to quantity.

ZINC CHLORIDE.—Fair inquiry for export. Quoted £25 to £28 per ton f.o.b.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ANTHRACENE (Pure, 88/90%).—Offered from the Continent at £60 per ton c.i.f. U.K. port.

BETA NAPHTHOL.—Small inquiries. Price quoted, 1s. 3d. per lb. carriage paid.

GAMMA ACID.—Small home inquiry. Price remains firm at about 15s. per lb., 100% basis.

" H " ACID.—Several inquiries. Prices lower, at 6s. 6d. per lb. on 100% basis.

PARANITRANILINE.—Price inclined to be lower. Now offering at 3s. 4d. per lb.

PARANITROPHENOL.—Home inquiry. Price, 2s. 3d. per lb., 100% basis, carriage paid.

PARADICHLORBENZOL.—Home inquiry. Price quoted, £50 per ton, carriage paid, packages free.

XYLENE (COMMERCIAL).—Home inquiry. Price quoted, 3s. 2d. per gallon f.o.r. works, drums returnable.

A New Tanning Process

A COMPANY is reported to be under organisation at Calgary, Canada, to establish and operate a tannery using the French vacuum or Nance process. It is stated that the promoters expect shortly to have the necessary capital to begin operations. They claim to have the rights for the process in Canada, and have selected Calgary as the point of manufacture for that portion of Canada west of the Great Lakes. The Nance process of tanning was invented by an Australian named Nance, and was patented in England ten years ago. A few years ago to tan under this process is said to have required fifteen days, since which time it has been discovered that by taking all the oxygen out of the tanning matter it is possible to turn out the product in six days. The labour required under the process is claimed to be only about 10 per cent. of that under the old method. The process consists of hermetically sealed tanks in which a vacuum is created, after which the tanning material is allowed to run in. Being under vacuum and without oxygen, it boils or is agitated like rapidly boiling water, under which condition the hide absorbs it. All the pores being open, the tanning material at once spreads throughout the mass, performs its function rapidly with no more damage to the material than under the old, slow process, and, it is claimed, with less damage to the texture.

German Chemical Trade Notes

FROM OUR OWN CORRESPONDENT.

Berlin, May 29, 1922.

DURING the past week the chemical market has shown no appreciable change, with the exception of some fluctuations resulting from the recent depreciation of the mark; at the close, reluctance from sellers and buyers was the prevailing feature. In spite of occasional price increases—particularly from makers—the undertone is unsettled, tending to sudden fluctuations, as prices for some products have reached the world markets' levels. There is thus no particular attraction for foreign buyers, while domestic purchasers have covered their requirements for months ahead.

Quotations on the various German markets, such as Berlin, Hamburg, Cologne, Frankfurt and Munich, vary widely, and the best way of doing business in chemical products is to strike an average between the quotations on the various exchanges.

The chemical industry is meeting with difficulties in regard to the granting of credits by bankers, and some cases are reported where manufacturers have bought chemical products from their customers which they had sold on contracts or on spot some time ago, as they are not able to produce the same product even at the increased price to-day.

Pharmaceutical products have shown some improvement; tartaric acid, acetyl-salicylic acid, potassium bromide and hexamethylene-tetramine have received most attention. Stocks in the hands of speculators are rather diminished, and the only business being done is in small parcels.

In view of the difficulty in arriving at a definite figure in many products, the following prices, in marks per kilogram (d.=domestic price; e.=export price), are given as average quotations:—

ACIDS: Acetic 80%, very scarce at 53 mk. d.; 51 mk. e. Acetyl-Salicylic, in good demand but scarce at 320 mk. d.; 375/400 mk. e. Benzoic, scarce at 175/180 mk. d.; 200/220 mk. e. Boric, 84/85 mk. d.; 88 mk. e. Citric—the tendency is firm at 320 mk. d.; 325 mk. e. Formic, 80/85%, technical, in fair demand at 29 mk. d. Muriatic has declined to 5 mk. e.; 1.80/2 mk. d. Oxalic, 98/100%, 45 mk. d.; 75/85 mk. e. Salicylic, 160/170 mk. d.; 200 mk. e. Tartaric, crystallised and powdered, 165 mk. d.; 190 mk. e.

INDUSTRIAL CHEMICALS: Alum: Chrome, 15%, scarce at 38 mk. d.; 42 mk. e.; Potash crystal powder, 9.25 mk. d.; 12.50 mk. e.; potash, in lumps, 13 mk. d.; 15.75/16 mk. e. Alumina sulphate, 14/15%, 6.50 mk. d.; 8.75 mk. e.; 17/18%, 10.50/11 mk. e. Ammonia Carbonate, powdered, 20/23 mk. d.; 30/32.50 mk. e. Barium Chloride, 24 mk. d.; 25.50/26 mk. e. Bleaching Powder, 110/115°, 7.75 mk. d.; 14 mk. e. Bone glue, transparent, unchanged at 62 mk. d. Borax, crystallised, 40/41.75 mk. d.; 46 mk. e. Calcium Carbonate, A1 quality, 20 mk. e.; commercial quality, 17.50 mk. e. Calcium Chloride, 90/95%, 10 mk. e. Copperas, 6 mk. d.; 6.75 mk. e. Copper Sulphate, 98/100%, crystallised, 38 mk. d.; 40 mk. e. Dextrine, in good request with small stocks available; yellow is quoted at 45 mk. e. on a firm market. Epsom Salt, 3.15 mk. d.; 4.75/5 mk. e. Formaldehyde, 30 %, 56/58 mk. d.; 68 mk. e.; 40%, 75/80 mk. d.; 88 mk. e. Glauber's Salt, crystallised technical has declined to 2.75 mk. d.; 3.50 mk. e. Glycerine, 28°, 98 mk. d.; 108/110 mk. e. Lead, Red, 42/43 mk. d.; 44.50/46 mk. e.; Lead, White, powdered, 43/44 mk. d.; 46/48 mk. e.; in oil, 45/46 mk. d.; 47/49 mk. e. Sugar of Lead, 46 mk. d.; 52 mk. e. Lithopone, Red Seal, 30%, 19 mk. d.; 25.50 mk. e. Litharge, 43 mk. d.; 45.50 mk. e. Magnesium Chloride, fused is unchanged at 2.75 mk. d.; 6.30 mk. e. Potassium Bichromate, 66 mk. d.; 85 mk. e. Potassium Carbonate, 28 mk. d.; 40/45 mk. e. Potash Caustic, 88/92 %, 29 mk. d.; 38.50 mk. e.; liquor, 50°, 12.75 mk. d.; 21.50 mk. e. Potassium Chlorate, powdered, 30 mk. d.; in brisk demand for export at 37/40 mk. Potassium Metabisulphite, in request for export at 60/65 mk. Potassium Permanganate, 70 mk. d.; 78/80 mk. e. Potassium Prussiate, Red, in strong demand from abroad at 420 mk. Potash Saltpetre is unchanged at 29 mk. d. Sal Ammoniac Spirit, 0·910, 11 mk. d.; 25 mk. e. Salt Cake, 5.20 mk. d.; 6.10 mk. e. Skin glue, A1 quality, 75 mk. d. Soda, crystallised, 7.50 mk. d. Soda Ash, 96/98%, 14.75 mk. d.; 13.75 mk. e. Sodium Benzoate, in strong demand at 165/180 mk. d. Sodium Bicarbonate, Ph. G. 5, 8 mk. d.; 18 mk. e. Sodium Bichromate, 56 mk. d. Soda Caustic, 125/128°, 31 mk. d.; 32.50 mk. e.; liquor, 38/40°, 12.50/14 mk. d. Sodium Hyposulphite, crystallised, 13.50 mk. d.; 16.80 mk. e.; pea form, 16/17 mk. d.; 18.50/19 mk. e. Sodium Sulphide, 30/32%, 11/12 mk. d.; 14/15 mk. e.; 60/62%, 24/26 mk. e. Strong Glue, 62 mk. d. Zinc Chloride, 23 mk. d.; 26 mk. e. Zinc, White, Red Seal, 38/39 mk. d.; 51 mk. e.; Green Seal, 41 mk. d. Benzaldehyde, 150 mk. d.; 180 mk. e. Carbolineum.—Pure oil goods are offered at 7 mk. d. Naphthalene, pure, in good request at 18/19 mk. d.; 20 mk. e. Tetraline A1 (Dekalin), 29 mk. d.; commercial quality, 21.40 mk. d. in tank car lots.

Chilean Nitrate Industry

An Official Review

IN his report on the industrial and economic situation in Chile, dated December, 1921 (obtainable from H.M. Stationery Office), Mr. W. F. V. Scott, Commercial Secretary to H.M. Legation, Santiago, says the nitrate industry of Chile is that upon which the prosperity of the Republic depends; she derives, in normal times, 75 per cent. of her State revenue from the export duties on this product. The larger part of this industry is conducted by Chilean companies, which produce about 55 per cent. of the total output. Next in importance are the British companies with about 30 per cent. of the output, then follow Jugoslav, Peruvian, American, Spanish and German producers. Between 50,000 and 60,000 workmen are employed in the nitrate works, and they consume over 300,000 tons of coal and 450,000 tons of petroleum. The Association of Nitrate Producers now represents 98 per cent. of the total production and practically controls the supply.

Competitive Fertilisers

The nitrate situation during the past year has been the most complex in the history of the industry. The unprecedented financial crisis in Europe and America at the end of 1920 upset all calculations as to probable consumption, and by the resultant restrictions of credit facilities and consequent reduction of the world's purchasing power, consumers were in many cases forced to content themselves with 50 per cent. of their normal requirements. Much has been written about the high prices alone having unfavourably influenced consumption, owing to the sale at cheaper prices of competitive fertilisers, more especially of sulphate of ammonia. There is no foundation for this belief. The average price at which nitrate was sold in Europe was about £20 per ton, and although sulphate of ammonia was always offered at well under this price it was estimated by one of the trade authorities that outside Germany not more than 100,000 tons of sulphate of ammonia were sold in replacement of nitrate in Europe—and this is largely proved by the fact that at the end of the last consuming season there remained stocks of sulphate of ammonia in Europe of over 100,000 tons—so that had it only been a question of price these 100,000 tons too would have been consumed, with a corresponding reduction in the demand for nitrate. It was the lack of confidence among consumers, owing to falling markets and restrictions of credit facilities, that caused such a shortage in consumption. In America, where prices ruled at £13 to £15 per ton, the falling off in consumption was greater than in Europe, which again indicates that it was not a question of price.

Cost of Production

In the summer of 1920, when future prospects appeared to be very favourable, importers in Europe and America contracted with the Chilean Nitrate Producers for a total of 2,750,000 tons, of which they were only able to sell in consuming markets about 1,450,000 tons, leaving on June 30, 1921, unsold stocks of over 1,300,000 tons. These had been contracted for at about 17s. per quintal, and brought to consuming markets at a freight averaging nearly £5 per ton; the cost of this nitrate, landed and put in store in consuming markets, thus amounts to nearly £25 per ton. This was a very grave situation for those dealers who in the ordinary course of their business took the risk, in purchasing from the Chilean Producers at high prices, of bringing this nitrate forward to consuming markets unsold. To-day they find themselves faced with a much cheaper cost of production in Chile and lower freights, so that new nitrate can be sold at a profit at £15 per ton in competition with them.

In addition to the stocks in dealers' hands, there were, on June 30, 1921, unsold stocks in producers' hands of about 1,100,000 tons, and in consequence a very large proportion of producers have already closed down their oficinas, and the monthly production, which normally amounts to 240,000 tons, fell to about 80,000 tons. Chile is accordingly faced with a serious financial position, having lost a very large proportion of her revenue by the loss of duties on nitrate shipments, by the necessity of feeding the 50,000 men from the nitrate district, who are at present out of work, and by the lack of outlet for her agricultural products, which, in normal times, look to the nitrate pampas for their market. It is vital to Chilean interests that the nitrate industry be revived at the earliest possible moment.

Company News

BLEACHERS' ASSOCIATION LTD.—Out of an available balance of £991,779 the directors recommend placing £125,000 to general reserve and £75,000 to superanuation; also a further dividend on the ordinary shares of 10 per cent., making 12½ per cent. for the year, carrying forward £359,406.

ZINC CORPORATION, LTD.—The directors announce a dividend of 2s. per share on the preference shares, being the second half of the fixed dividend of 20 per cent. for the year 1921, payable on June 30, less tax.

JOSEPH NATHAN AND CO., LTD.—The company have been offering 250,000 "A" 7 per cent. cumulative preference shares of £1 each at par to shareholders, the additional capital being required, it is stated, for dealing with the increased business of the company. The shares are offered in the proportion of one new in respect of every three shares of any class now held.

ANTOFAGASTA NITRATE CO.—The prospectus was issued on Tuesday, inviting offers for £500,000 6½ per cent. first mortgage debentures at 97½, redeemable at 102 by an annual sinking fund of not less than £34,000. Firm applications for £210,000 of the debentures now offered have been received from underwriters. The yield, subject to income tax, is £6 13s. 4d. per cent., without including profits on redemption. The debentures, which are the whole of the authorised issue, will be secured by a trust deed providing for the creation of a specific first mortgage under Chilean law over the eight oficinas with lands and nitrate grounds, comprising an area of about 64 square miles. The profits, which are set out in full for the ten years to December 31 last, averaged £427,904 per annum. The company's property is said to contain 200,000,000 Spanish quintals of nitrate. The subscription lists were closed at 10.15 on Tuesday morning, the amount offered having been largely over subscribed. Country applications received by first post on Wednesday were considered.

TARAPACA AND TOCOPILLA NITRATE CO.—A new issue of capital which is to be made shortly. The issue, which consists of 40,000 shares of 10s. each, is to be offered to existing shareholders on a share for share basis. The price of issue will be 12s. per share, and the whole of the issue has been underwritten at 6d. per share. The new shares will rank for dividend *pari passu* with the existing shares as from July 1, though instalments are spread over a period extending to December 15.

BRITISH SOUTH AFRICAN EXPLOSIVES CO., LTD.—An extraordinary general meeting will be held at Nobel House, Buckingham Gate, London, on June 7, at 12.15 p.m., to consider new articles of association. A second extraordinary general meeting will be held at the same place on June 23, at 12.15 p.m.

ANGLO-CHILIAN NITRATE AND RAILWAY CO., LTD.—Tenders are invited, by June 12, for the redemption of the company's 4½ per cent. consolidated mortgage bonds. Forms of tender may be obtained from the company's office at 13, Fenchurch Avenue, London, but their use is not essential.

PYRITES DE HUELVA.—The report for 1921 shows a net profit of 1,778,044 fr. against 2,165,279 in 1920. The dividend is maintained at 50 fr.; the reserve fund takes 262,728 fr. and 188,506 fr. is carried forward.

Contracts Open

Tenders are invited for the following articles. The latest dates for receiving tenders are, when available, given in parentheses:

ALTRINCHAM (June 12).—Oxide of iron (140 tons), and purchase of about 230 tons spent oxide. Tenders to Chairman, Altrincham Gas Co. Samples and analyses to H. R. S. Williams, Gasworks, Altrincham.

CAMPBELTOWN.—Proposed installation of tar dehydrating plant. Particulars from Gas Committee, Campbeltown.

DERBY (June 13).—Soda, soap, etc. Forms from F. C. Smithard, Education Offices, Becket Street, Derby.

DUNDEE (June 13).—Oils and paints. Particulars from and tenders to J. H. Thompson, Dundee Harbour Trust, Dundee.

LONDON (June 13).—Lead, brass, copper, zinc and glass. Forms from and tenders to Chief Engineer, New River Head, 173, Rosebery Avenue, London.

MANCHESTER (June 13).—Pitch and creosote oil. Forms from J. M. McElroy, 55, Piccadilly, Manchester.

New Laboratories at Swansea

A RECEPTION was held at the Swansea University College on Monday for the purpose of making the visitors acquainted with the progress which has been made in connexion with the provision and equipment of the metallurgy, physics, and chemistry departments. The first named is actually in being and students have been at work in the laboratory for a month. The expenditure on this section has amounted to £13,000, with £4,000 in addition for equipment of the latest and most up-to-date character. The outer walls of the building are of expanded metal with plaster surface, and the inner walls of 2½ in. coke breeze concrete. The lecture hall has accommodation for over 200 students. The metallurgical department is furnished with one of the latest types of apparatus for microscopic work and photomicrography. There are also a physical testing room especially adapted for testing the tensile strength of metals, a room for the electric refining of copper, nickel, zinc, and tin for experimental purposes, a chamber for electric and magnetic testing, a hall for pyrometry where the staff can carry out their own researches, a chief's room fitted with a private laboratory, a research laboratory for the sole use of men who have graduated, a spacious analytical laboratory, a feature of which is a supervision room so fixed as to enable the supervisor to have complete observation not only of his own room but of the necessary auxiliaries, a furnace room for work on gold and silver, a sampling room, etc. Great praise was bestowed by the visitors upon Professor C. A. Edwards, vice-principal of the college and head of the metallurgical department, for his excellent planning of this section of the college.

Tariff Changes

SPAIN.—For the purpose of "legalising" original invoices covering goods dutiable *ad valorem*, Chambers of Commerce in foreign countries are now regarded as local authorities competent to effect such legalisation in accordance with Article 5 of the Royal Decree of February 1 last. Details of the new rates were given in the *Board of Trade Journal* of May 18 (page 560).

EGYPT.—The exportation of chemical manures is now allowed without the requirement of a specific licence from the Egyptian Ministry of Finance. Revised tariff valuations for use in assessing the Customs duties leviable on the importation of certain non-ferrous metals are effective from May 1 last to June 30 next, or until denunciation.

GERMANY.—The internal taxes on matches, tapers and stearine, ether and products containing ether, have been increased. The importation of shavings and waste of pure aluminium and aluminium alloy is permitted without licence until further notice, but an import licence is still required for the importation of pure aluminium and aluminium alloy in blocks.

MADAGASCAR.—A decree relating to the marking of graphite on exportation provides for the sampling and guarantee by means of a seal. Particulars may be obtained at the Tariff Section of the Department of Overseas Trade, 35, Old Queen Street, London.

MOROCCO (FRENCH ZONE).—As from May 1 the exportation of wood charcoal, and oil of "argan" is prohibited. A certain "proportion" of the latter may be exported under certain conditions.

POLAND.—Aceto-arsenite of copper is now exempted from Customs duty. The surtax on the following goods, *inter alia*, is fixed at 900 per cent.: Fertilising compounds and mixtures, ground graphite, ammonium nitrate and sulphate, nitric acid and nitrose, palm oil, and certain other vegetable oils, dye earths and cellulose. A surtax of 4,900 per cent. is imposed on oleine, asbestos, anthracene, naphthalene, carbolic acid, crude benzol, sulphur (purified), sulphide and hydrosulphate of soda, carbon disulphide, naphthols and sulphonic derivatives, nitrate of thorium, cerium, etc., chloride of lime, calcium acetate, sulphuric ether, tanning extracts, etc. A full list was published in the Board of Trade *Journal* of May 25 (p. 592.)

LATVIA.—A revised Customs tariff is expected to become operative some time this month or in July. It is understood that the changes proposed are nearly all in the nature of reductions of the present duties.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

GAINBERT, P. S., 139, High Road, Wembley, chemist. £16 16s. March 29.

HODGSON, W. (trading as HAMPTON CHEMICAL CO.) 10, Bell Hill, Hampton-on-Thames, chemist. £11 19s. March 21.

IMPERATOR DISINFECTANTS, LTD., East Canal Wharf, Cardiff, disinfectant manufacturers. £33 13s. March 22.

JONES, Guy P., 29, Clifton Street, Kearsley, chemist. £62 18s. 6d. April 5.

JUDD, R. D., Cash Pharmacy, Wheathampstead, chemist. £13 0s. 11d. March 29.

LUNN, Horatio Nelson (and wife), Weelsby Road, Grimsby, chemist. £26 4s. March 21.

PAYNE, Ernest Edward, Red House, Narborough, analytical chemist. £10 12s. 8d. March 21.

SKEAT, C., 609, High Road, Tottenham, chemist. £12 1s. 1d. March 22.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

BUZZARD GLASS WORKS, LTD., London, W.C.—Registered May 18, £1,000 charge, to A. J. J. Arnold and another, 124 Tottenham Court Road, W.; general charge. *Nil. January 30, 1922.

CATALYTIC CHEMICAL CO., LTD., Southall.—Registered May 16, £100 debentures part of £10,000; general charge.

McLEOD (HULL), LTD., manufacturers of toilet articles.—Registered May 15, mortgage, to bank.

WAVERLEY WORKS, LTD., St. Albans, bleachers and dyers.—Registered May 19, debenture, to bank. *Nil. November 1, 1921.

Satisfaction

TIDMAN AND SON, LTD., London, E.C., chemists.—Satisfaction registered May 17, £70, part of amount registered August 25, 1921.

London Gazette

Winding Up Petition

INECTO, LTD.—A petition for winding-up has been presented, and is to be heard at the Royal Courts of Justice, Strand, London, June 13, 1922.

Companies Winding up Voluntarily

CALDERS MARGARINE CO., LTD.—W. L. Pattison, 61, Inglemere Road, Rock Ferry, Chester, appointed liquidator.

ORGANIC RESEARCH CO., LTD.—R. A. Willis, 5, Crown Court, Chancery Lane, London, appointed liquidator.

Liquidator's Notice

GENERAL PETROLEUM LANDS CORPORATION, LTD.—Particulars of claims to J. J. Ure, 59-61, New Oxford Street, London, W.C.1, the liquidator, by June 13.

Notice of Dividend

GRANTHAM, Reginald, 66, Blossom Street, York, chemist. Amount per £, 3s. 10½d. First and final. Payable June 7. Official Receiver's Offices, Red House, Duncombe Place, York.

Notice of Intended Dividend

TOWNSEND, Benjamin John, and JOHNSON, Bernard Charles, in co-partnership under the style of THE TRENT SOAP AND CHEMICAL CO., Bank Square, Burton-on-Trent, chemical manufacturers. Last day for receiving proofs, June 13. Trustee, R. B. Rhodes, 18, Low Pavement, Nottingham.

Partnership Dissolved

LOW, Henry Vales, PATTINSON, John Herbert, and LOW, Charles Abbott, chemical, etc., merchants, 3, London Wall Buildings, London Wall, London, under the style of G. F. BERRY AND CO., by mutual consent as from May 22, 1922, so far as concerns J. H. Pattinson, who retires from the firm.

Edinburgh Gazette

DICKSON (R. B.) AND CO., chemists, 745, Great Eastern Road, Parkhead, Glasgow (Robert Brown Dickson, trading as). A petition for sequestration has been presented at the instance of Allen and Hanbury's, Ltd., manufacturing chemists, 37, Lombard Street, London, E.2.

New Companies Registered

ALBION SHELLAC CO., LTD., 1, Gresham Buildings, London. Manufacturers of white lac and substances of a resinous nature and chemicals, dealers in fine and heavy chemicals, etc. Nominal capital, £5,000 in 3,000 8 per cent. participating preference shares of £1 and 4,000 ordinary shares of 10s. each.

N. BARENDS AND CO., LTD., 17, Lord Street, Stockport. Chemical manufacturers. Nominal capital, £1,500 in £1 shares.

BUDGE, LTD., Trafalgar Buildings, 1, Charing Cross, London. Manufacturers of and dealers in disinfectants, chemicals, etc. Nominal capital, £20,000 in £1 shares.

CARBIDE CORPORATION, LTD., 15, Victoria Street, Westminster, London. Manufacturers of and dealers in calcium carbide, or of other chemical products or substances, oxygen or other gases. Nominal capital, £1,000 in £1 shares.

CYPRUS ASBESTOS CO., LTD. (Incorporated in Cyprus). Asbestos, oil, asphalte, and bitumen producers and refiners, etc. Nominal capital, £St.300,000 in 285,000 preferred 10 per cent. participating shares of £St.1 each, and 300,000 deferred shares of 1s. each. A director: Lord Inchcape, Seymour Place, London.

FLEUROL (LONDON), LTD., 90, City Road, Newcastle-on-Tyne. Perfumery and toilet soap manufacturers. Nominal capital, £100 in £1 shares.

FUEL LABORATORIES, LTD., 15a, Duncan Street, Edinburgh. Analysts, chemical consultants, and consulting engineers. Nominal capital, £500 in £1 shares.

GRAYSON (CHEMISTS), LTD., 16, Great James Street, Bedford Row, London. Chemical manufacturers, importers and exporters, etc. Nominal capital, £4,000 in £1 shares.

HARRY GREEN, LTD., 156a, Devons Road, Bow, London. Seed crushers, oil extractors, manufacturers, and refiners, etc. Nominal capital, £2,000 in £1 shares (1,997 preference and 3 ordinary).

ROWANS CHEMICAL WORKS, LTD., 66, Fenchurch Street, London. Agents for chemists, druggists, etc. Nominal capital, £100 in £1 shares.